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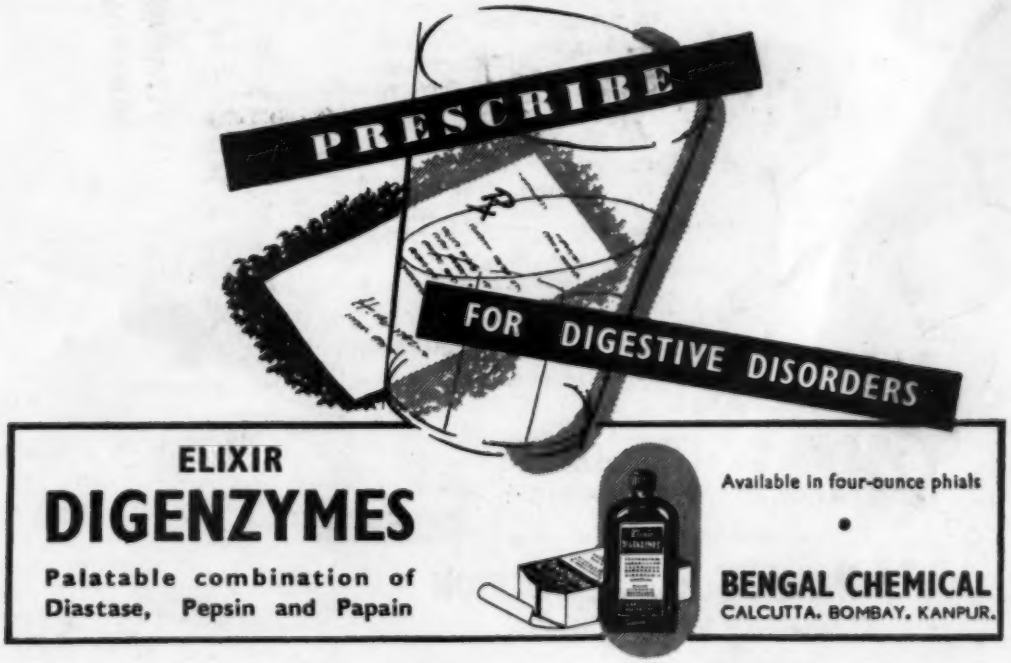

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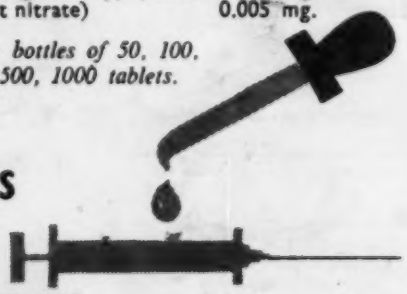

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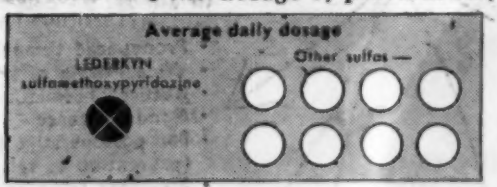

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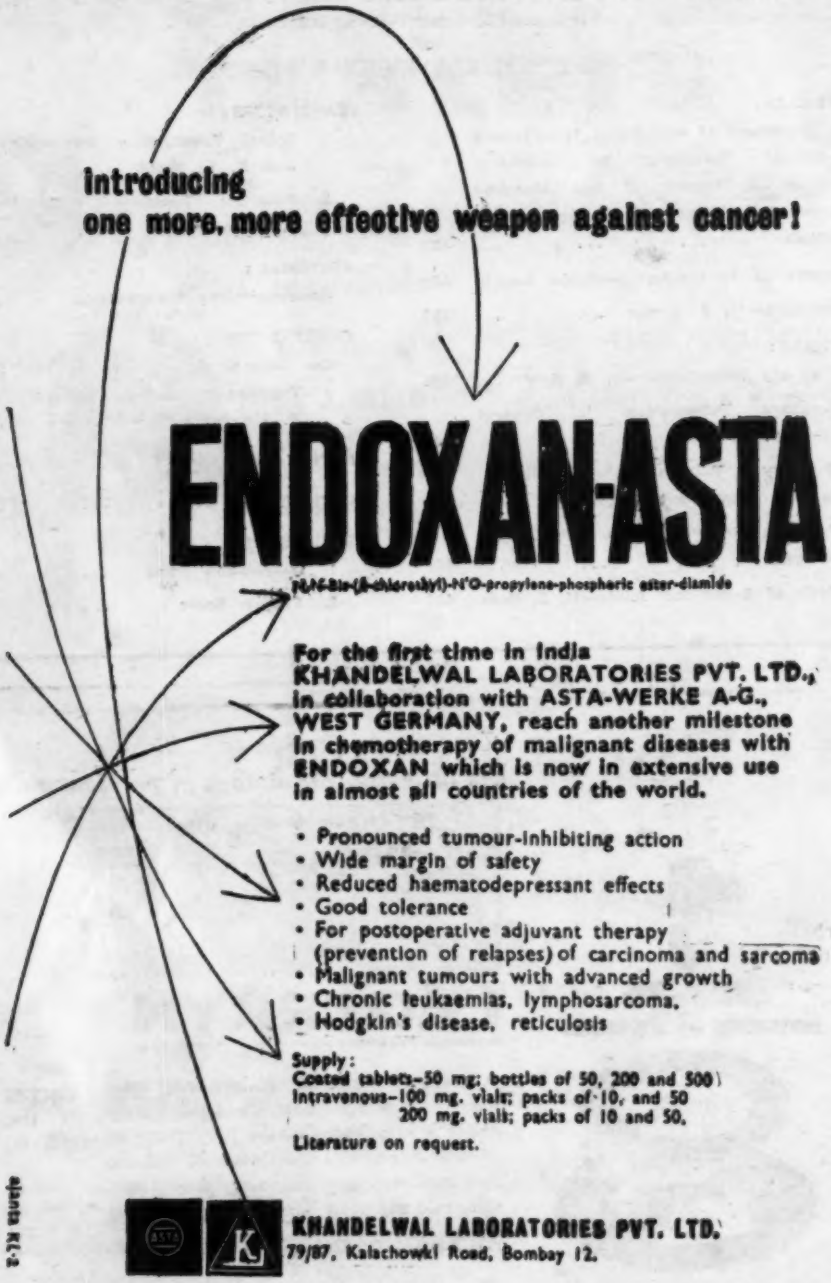

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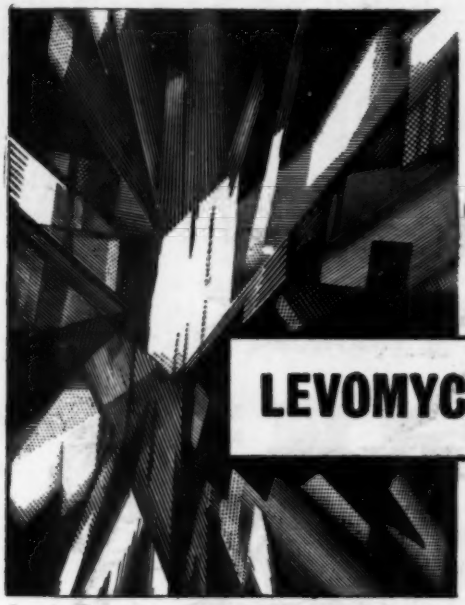

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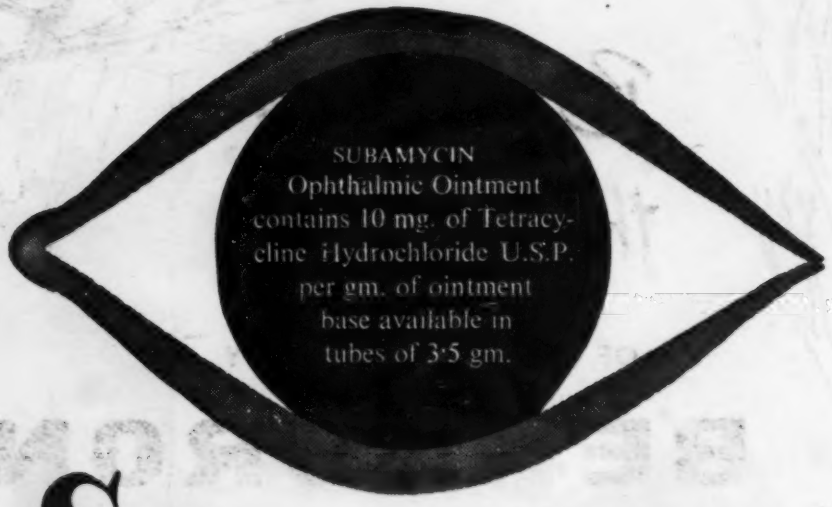

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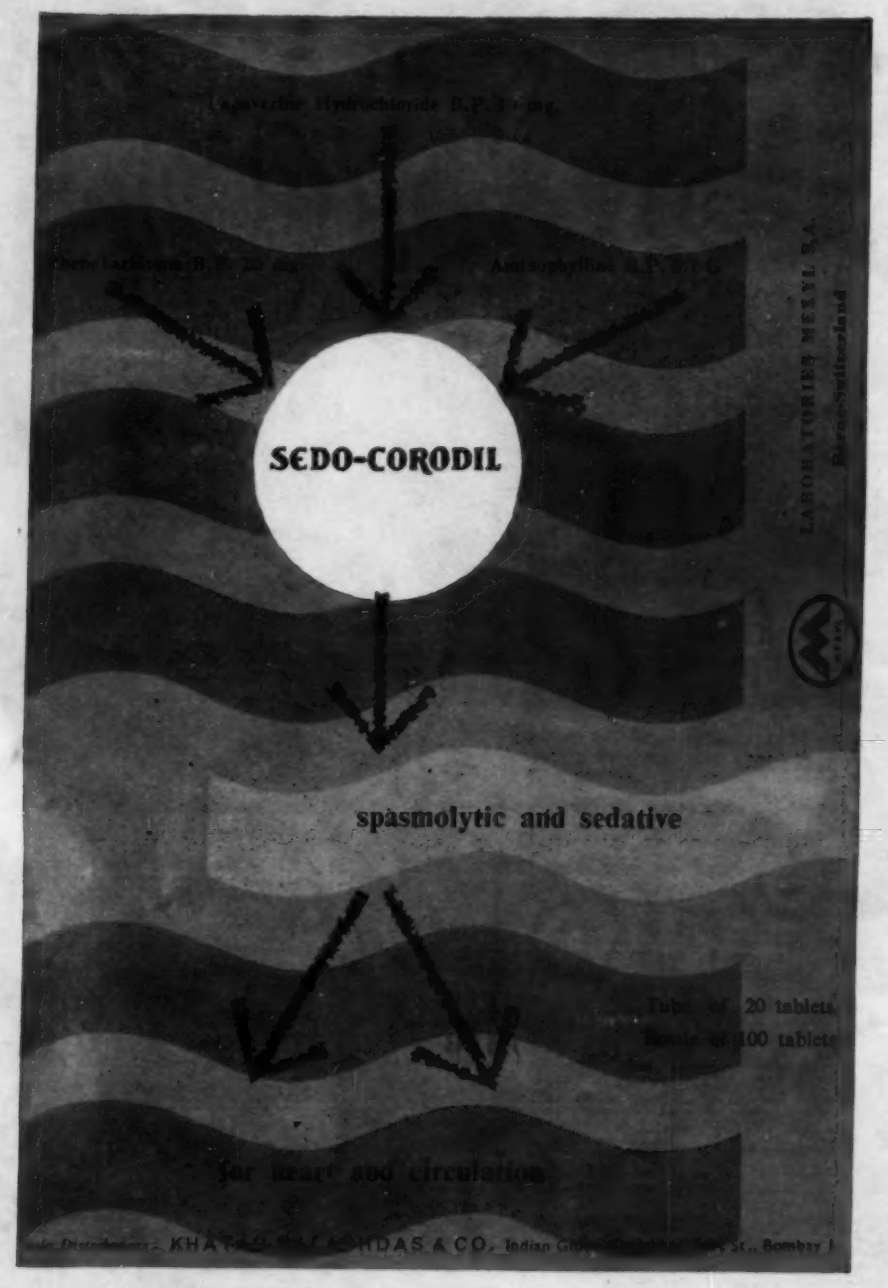
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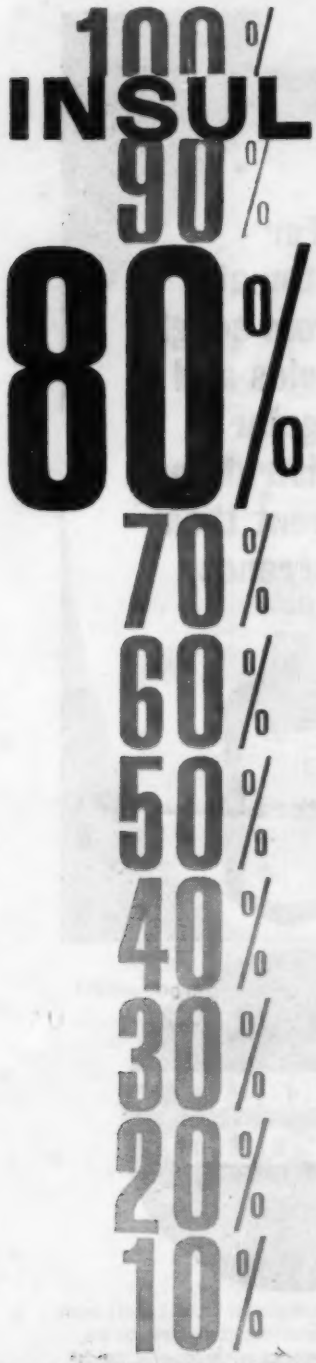

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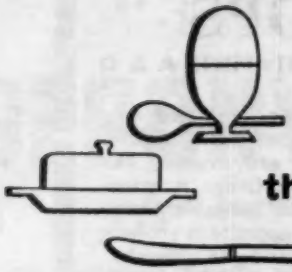

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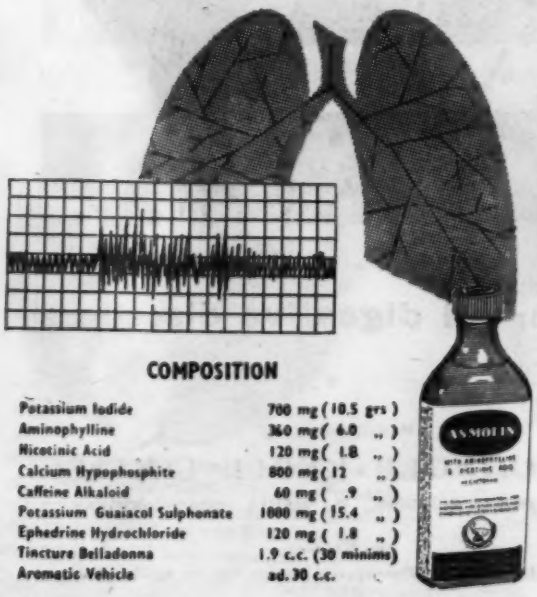

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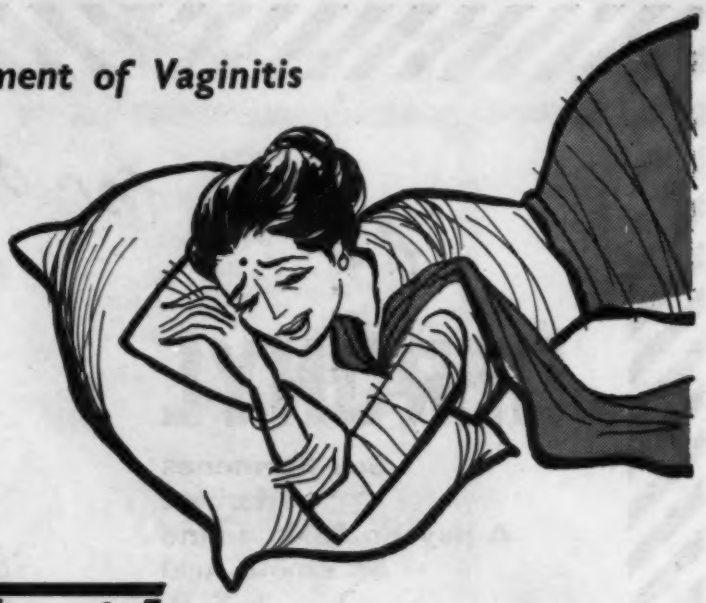

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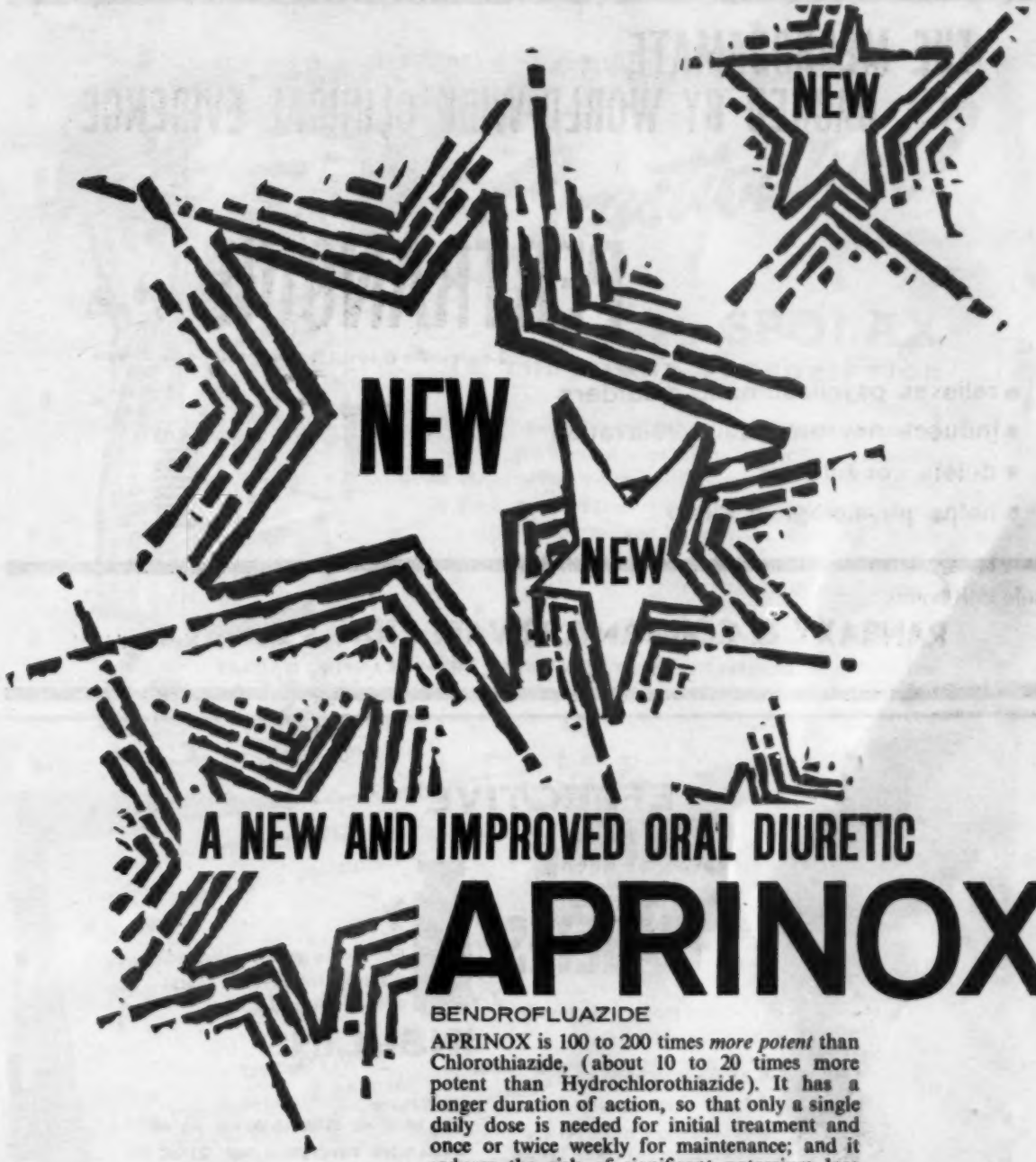

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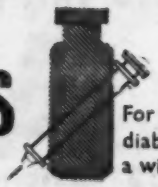

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CALCUTTA
NOVEMBER 1, 1961

ORIGINAL ARTICLES

SURGICAL TREATMENT OF ABDOMINAL TUBERCULOSIS WITH SPECIAL REFERENCE TO ILEOCAECAL TUBERCULOSIS

A Record of One Hundred Cases Treated Surgically

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Abdominal tuberculosis presents itself in several forms in the surgical wards of a general hospital. Most commonly the surgeon comes across the hypertrophic ileocaecal tuberculosis. The disease is still very common in this country although in the western countries where tuberculosis is becoming a controlled problem many clinicians and even pathologists have become sceptical about the very existence of this disease as a separate entity. This trend of opinion has been seen more frequently after the publication of the classical paper of Crohn *et al* (1932) in which a chronic granulomatous condition of the terminal ileum was described. In 1940, Crohn and Yarnis described similar lesions in the caecum, transverse colon and elsewhere. This confusion has arisen because the gross and microscopic appearances of Crohn's disease are similar to ileocaecal tuberculosis, although caseation is never seen in regional ileitis. The second factor responsible for this attitude is mainly due to the absence of any evidence of positive culture of tubercle bacilli in specimens from ileocaecal region removed at the time of the operation. In the Hunterian lecture by the senior author (Anand 1956) a careful analysis of the work done in the departments of pathology and surgery at the Medical College, Amritsar, on the basis of fifty hemicolectomies was presented, with positive proof of tuberculous histopathology. "The criteria of pathological diagnosis which we have observed in the specimens are the presence of caseation necrosis invariably in glands and sometimes in the wall of the gut. Of the fifty cases thirty-nine did not show any associated lung lesion and these were classified as cases of primary intestinal tuberculosis. In eleven cases there was evidence of healed lesions in the lung. The glands and intestinal scrapings were cultured from these thirty-nine cases of primary intestinal tuberculosis and tubercle bacilli were isolated in twenty-five cases ; out of which positive cultures from the glands were obtained in fourteen cases and positive cultures from both glands and intestinal scrapings in eleven cases. The typing of these bacilli showed that they were of human type."

In the present paper the result of treatment of 100 cases of tubercular disease of the abdomen is presented. They included 81 cases of hypertrophic ileocaecal tuberculosis, 15 cases of stricture of small gut and 4 cases of enlarged lymph nodes.

The hypertrophic ileocaecal disease presented itself with pain in the abdomen and a lump in the right iliac fossa. The last two groups of cases presented themselves with symptoms of acute or subacute intestinal obstruction and were admitted into the surgical ward. The surgical importance of tuberculous ulceration of the small gut is due to the encircling ulcer producing cicatricial contraction after healing and thus producing obstruction. These ulcers, as is well known, are multiple and so the surgeon is presented with several segments showing dilatation and sacculation which are quite characteristic. Obstruction is also caused by kinking of the bowel due to adhesion with a neighbouring caseous gland or due to tuberculous adhesive peritonitis. Tuberculous peritonitis is generally associated with tuberculous ulceration of the bowel or tuberculous mesenteric glands.

Clinical Feature

Table 1 shows age and sex distribution of 100 operated cases of abdominal tuberculosis.

Table 1—Showing Age and Sex Incidence of 100 Operated Cases

Age (in years) at the time of admission	Male	Female	Total
Under 10 ...	—	—	—
10—14 ...	—	5	5
15—20 ...	3	18	21
21—30 ...	16	37	53
31—40 ...	4	12	16
41—50 ...	1	4	5
Above 50 ...	—	—	—
Total ...	24	76	100

Table 2 shows the main clinical symptoms in these 100 patients.

Table 2—Showing Incidence of Clinical Symptoms in 100 Operated Cases

Symptoms	No. of cases
Abdominal pain	100
Vomiting	73
Barborygmi	54
Loss of weight	43
Local or generalised distension	42
Anorexia	40
Fever	40
Mass in abdomen	40
Constipation	40
Weakness	30

Table 3 shows the duration of symptoms.

Table 3—Showing Duration of Symptoms

Duration	No. of cases
Up to 3 months	7
4— 6 months	9
7—12 months	14
Over 1 year	18
Over 2 years	28
Over 3 years	24
Total ...	100

Physical examination—Examination revealed that most of the patients were anaemic, poorly built and poorly nourished. A lump in the abdomen was palpable in about half the cases. In a few cases peristalsis of ladder pattern were visible. Enlarged lymph nodes were palpable only in a small number of cases.

Investigations—Routine estimation of red blood corpuscles, haemoglobin percentage, erythrocyte sedimentation rate and sputum and stool examinations were done in every case. X-ray examination was carried out by a scout film of the abdomen. Skiagram of chest and barium meal and barium enema studies of the intestinal tract were also done (Figs. 1, 2 and 3, *vide* Plate).

Surgical Treatment

Most of the patients were operated after a proper course of pre-operative treatment. In a small minority who came with symptoms of acute intestinal obstruction early operation had to be undertaken. This type of cases usually yielded to general measures like decompression by a Ryle's tube, maintenance of fluid balance by intravenous administration of fluids and sedatives in the form of morphine grain 1/6 and atropine grain 1/100, 6 hourly. These measures were adopted to tide over the acute episode of intestinal obstruction and definitive treatment was provided by surgery later on.

Pre-operative management:

This is very important for keeping the operative mortality at a low figure. The patient is hospitalised at least a week in advance of the contemplated operative procedure. Anaemia and hypoproteinaemia are corrected by whole blood transfusion. Patient is put on high protein diet with low residue. All patients are put on antituberculous chemotherapy. In cases where it is contemplated to do a right hemicolectomy it is essential to reduce the bacterial flora of the

Fig. 1—Barium meal study showing filling defect in the caecum and ascending colon. The terminal ileum is dilated.

Fig. 2—Barium meal study showing filling defect in the caecum and ascending colon.

Fig. 3—Barium enema study showing filling defect in the caecum.

Fig. 6—Showing typical tuberculous histopathology (low power in lymph nodes).

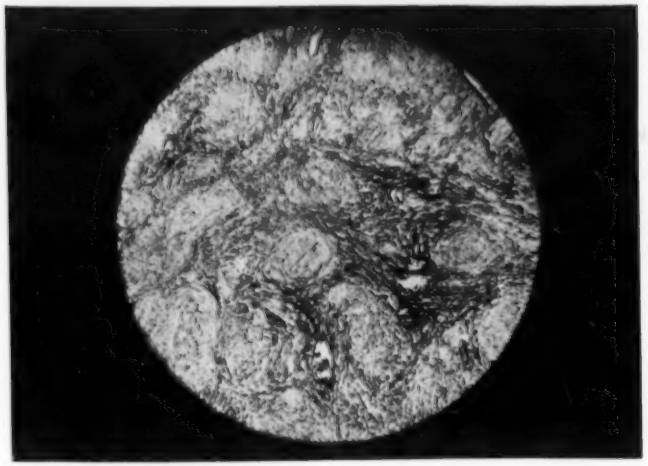
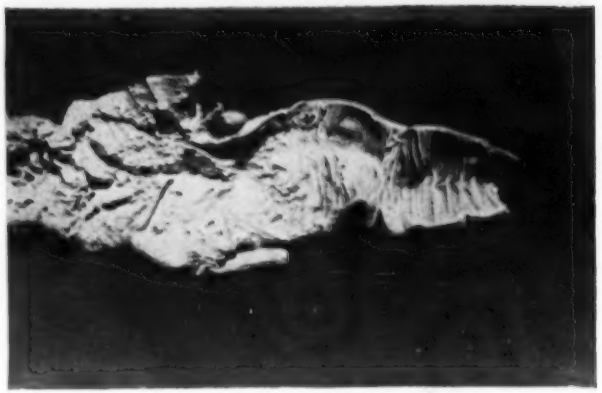
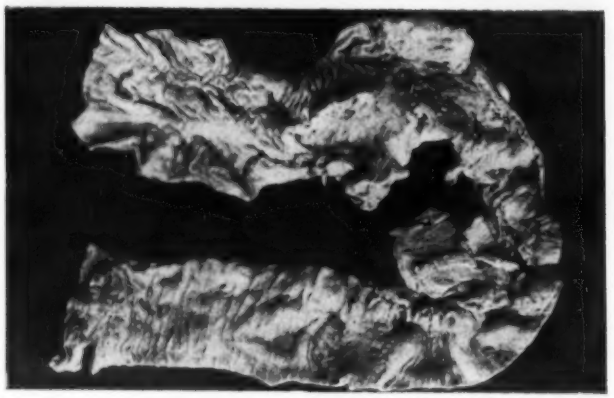


Fig. 7—Showing typical tuberculous histopathology (low power in lymph nodes).

Fig. 8—Showing lymphocytic infiltration with giant cell formation in caecum (low power).





Figs. 9 and 10—Opened up specimens showing marked thickening of the lumen. The ileum is dilated.

ANAND AND PATHAK—*Surgical Treatment of Abdominal Tuberculosis with Special Reference to Ileo-caecal Tuberculosis* *(p. 423)*

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intestine. This procedure reduces the operative mortality and prevents postoperative complications by any leakage at the suture line or by infection of the abdominal wound. The value of this therapy has been shown experimentally by the fact that even devascularised segments of bowel can survive if antibiotics are administered. We have used sulphathalazole in 3—4 g. doses four times a day for five days. Sulphathalidine has been shown to be twice as effective. These poorly absorbed sulpha drugs can be combined with broad-spectrum antibiotics. Sulphathalidine with neomycin is a very good combination. 1·5 g. sulphathalidine with 1 g. neomycin is given every 4 hours for 72 hours before the operation. Parenterally administered antibiotics are of value in the postoperative period.

OPERATIVE PROCEDURES :

The following operative procedures (Table 4) have been adopted in these 100 cases of abdominal tuberculosis

TABLE 4—SHOWING NATURE OF OPERATION AND OPERATIVE MORTALITY

Nature of operation	No. of cases	Operative mortality
Hemicolectomy (one stage) ...	50	2
,, (two stages) ...	22	—
Ileotransverse colostomy ...	9	—
Resection of enteroanastomosis ...	15	—
Gastroenterostomy ...	1	—
Exploratory laparotomy ...	3	—
Total ...	100	2

It is essential to emphasise certain points in the operative technique.

Incision—In most of our cases we have used an oblique abdominal muscle cutting incision running from the right subcostal margin to the linea alba midway between umbilicus and symphysis pubis (Fig. 4). This incision gives a very good exposure and provides access to the parts of the right colon and terminal ileum to be removed. Further it permits a wide exploration of the whole of the gut. Lastly it has never been followed by an incisional hernia or burst abdomen. (We have had experience of a burst abdomen with a paramedian incision). During mobilisation of the right colon care should be taken not to injure the right ureter or the duodenum. After mobilisation of the right colon care should be taken not to jeopardise the blood supply of the cut ends of the bowel which have to be anastomosed. This is effected by placing the intestinal clamps obliquely (Fig. 5). Division of transverse colon is made on the right side of the middle colic artery to preserve the marginal anastomosis of the rest of the transverse colon. About 8-12 inches of the ileum is removed in right hemicolectomy. We have found that an end-to-end anastomosis of the transverse colon with terminal ileum gives the best physiological results. In a side-to-side anastomosis the closed end of one or the other side may baloon up and burst, as happened in one of our cases, leading to a localised abscess in the abdomen, which, however yielded to drainage. Right hemicolectomy has been performed as a single stage procedure in 50 cases and as a two stage procedure in 22 cases. We have always preferred a single stage procedure as we find that the patient is saved from the

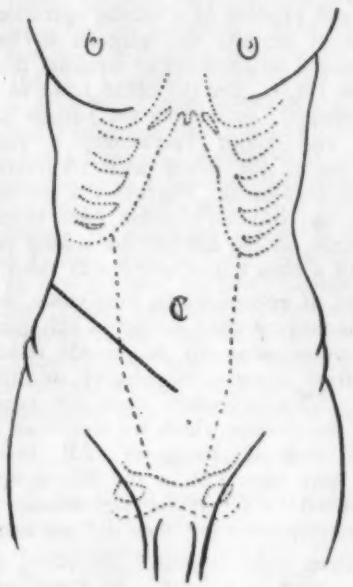

FIG. 4—SHOWING LINE OF INCISION FOR A RIGHT HEMICOLECTOMY (DIAGRAMMATIC)

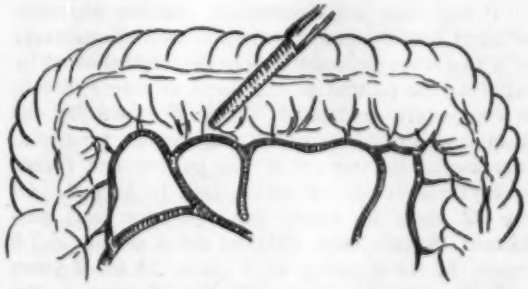

FIG. 5—SHOWING THE TRANSVERSE COLON AND THE POSITION OF THE INTESTINAL CLAMP (DIAGRAMMATIC)

anxiety and expense of a second operation. Furthermore, it permits the surgeon to carry out an end-to-end anastomosis of terminal ileum with transverse colon. On the other hand in the two stage procedure, apart from the patient having to undergo two major operations, a side-to-side anastomosis of the ileum with transverse colon has to be performed. Further the terminal ends of ileum and transverse colon have to be closed meticulously, at the time of the second procedure to prevent a blow out of any one of them.

Nature of operation—In nine cases, who were very poor surgical risks, we could only perform an ileo-transverse colostomy to provide relief to the patient from repeated attacks of intestinal obstruction. This procedure does not remove the focus of the disease which we feel is an essential part of surgical treatment. All these nine patients have been lost in the follow up. They were advised to report for the second stage of right hemicolectomy but they did not turn up.

In fifteen cases intestinal strictures, single or multiple, were met with. In these cases the caecum appeared to be normal but in most of the cases the neighbouring glands in the mesentery were found to be enlarged. In these cases resection of the diseased bowel with the involved glands was carried out, and followed by an end to end anastomosis.

There were four cases of tabes mesenterica. One of them showed a large bunch of glands causing marked obstruction just distal to the duodenojejunal flexure leading to dilatation of the stomach and duodenum with incessant vomiting. This girl was treated by gastrojejunostomy, which was followed by antituberculous chemotherapy for a year. She did extremely well. In the other three cases only an exploratory laparotomy was carried out for symptoms of intestinal obstruction, the dense adhesions, however, prevented any further surgical procedure.

RESULTS OF SURGICAL TREATMENT :

It has been our observation that the operation of right hemicolectomy, whether as a single stage or a two stage procedure, is invariably followed by relief to the patient as the focus of active disease is completely eradicated. This is shown by the disappearance of signs of tubercular toxaemia, increase in the weight of the patient and return of erythrocyte sedimentation rate to normal. Of the 72 cases in whom this operation was performed 18 have been followed for a period of 7-8 years, 32 for a period of 4 years, 12 for 2 years and 10 up to one year. Of the 72 cases in the follow-up 60 cases were in good health and showed no recurrence of symptoms. Twelve cases continued to complain of varying degrees of diarrhoea and pain in the abdomen. Nine cases of ileocolostomy have been lost to follow-up. Most of the cases of the ulcerative disease of the intestine in which resection and anastomosis had been performed have continued to show progress.

HISTOPATHOLOGY

All the specimens removed during operation were sent to the pathologist. Figs. 6, 7, 8, 9 and 10 (*vide* Plate) show the typical findings, both microscopic and macroscopic, in cases of ileocaecal tuberculosis.

Table 5 shows the analysis of histological lesions in the wall of the intestine.

TABLE 5—SHOWING HISTOLOGICAL LESIONS IN WALL OF INTESTINE

Nature of lesions					
Caseation necrosis with epithelioid cells and giant cells in follicle formation		Epithelioid cells and giant cells in follicle formation, but no caseation		Nonspecific inflammation	
No. of cases	Percentage	No. of cases	Percentage	No. of cases	Percentage
13	18·05	43	59·72	16	22·22

Table 6 shows the histological report of lymph glands in cases of ileocaecal masses operated by simple ileotransverse colostomy.

TABLE 6—SHOWING HISTOLOGICAL LESIONS IN LYMPH GLANDS

No. of cases	Chronic inflammation	Tuberculosis
6	5	4

Table 7 shows biopsy report of lymph glands and intestine in cases of stricture of the small gut.

TABLE 7—SHOWING BIOPSY REPORT OF LYMPH GLANDS AND INTESTINE

No. of cases	Lymph glands		Intestine	
	Chronic inflammation	Tuberculosis	Chronic inflammation	Tuberculosis
15	7	4	5	8

Summary

The surgical treatment of 100 cases of abdominal tuberculosis has been reviewed. Of these 81 cases had hypertrophic ileocaecal tuberculosis, fifteen cases had intestinal strictures only and four had enlarged lymph nodes. Right hemicolectomy was performed in seventy two cases. Fifteen cases were treated by resection of small gut with entero-anastomosis. One case required gastro-enterostomy for obstruction at the duodenojejunal flexure caused by enlarged lymph nodes. The follow up results of these cases have been evaluated.

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THE INTRACRANIAL TUBERCULOMAS

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Tuberculomas are by far the commonest of intracranial granulomas. In our country where pulmonary tuberculosis is still one of the major lethal ailments, tuberculomas of brain are also not very rare. This incidence of tuberculomas is directly linked to the same socio-economic factors which have resulted in high incidence of tuberculosis in general amongst our population.

Pathological Considerations

Miliary tuberculosis may produce diffuse or localised tuberculosis in the brain. These localised foci may gradually grow into space occupying masses, necessitating neurosurgical intervention. Localised tuberculous lesions may be single or multiple. A tuberculoma may grow up to a considerable size before producing clinical manifestations. Histologically the usual cellular characteristics of typical tuberculous lesions elsewhere are reproduced in tuberculomas of the brain, but giant cell systems may not always be encountered. One of our operated specimens of tuberculoma however showed a definite giant cell.

Review of Literature

Starr (1886) found as many as 152 tuberculomas in a series of 300 brain tumours in children. Bruns (1908) reported 10 tuberculomas in a series of 63 brain tumour autopsies. In a series of 187 brain tumours, 5 tuberculomas were found by Tooth (1911). Cushing (1932) found 44 tuberculomas in a series of 2023 verified cases. Toennis (1937) had 7 tuberculomas in his own series of 638 verified brain tumours. Asenjo *et al* (1951) found 97 tuberculomas in a series of 610 brain tumours. In our country Reddy (1951) found 10·5 per cent tuberculomas in autopsies made at the Madras Medical College and 14·5 per cent in autopsies made at the Andhra Medical College. Chandy and Isaiah (1952) had 8 tuberculomas in a series of 40 brain tumours. According to Descuns *et al* (1954) tuberculomas are still fairly common in Algeria (North Africa). Ramamurthi (1956) had 35 tuberculomas in a series of 180 brain tumours.

Materials

During the period from 1955 to February 1961, 183 specimens of intracranial space-occupying lesions were histologically verified in the Neurological unit, S.S.K.M. Hospital, of which there were 16 cases of tuberculoma (8·7 per cent). The incidence of different types of intracranial tumours, in the present series is given in Table 1.

Table 1—Showing Incidence of Different Types of Brain Tumours in the Author's Series

Histology	No. of cases
Glioblastoma multiforme	19
Astrocytoma	25
Medulloblastoma	12
Oligodendroglioma	5
Ependymoma	4
Meningioma	26
Acoustic neurinoma	11
Chemodectoma	1
Pituitary adenoma	20
Craniopharyngioma	7
Epidermoid	1
Teratoma	2
Tuberculoma	16
Fungal granuloma (*C. trichoidis*)	1
Nonspecific granuloma	2
Haemangioblastoma	4
Angioma	2
Choroid plexus papilloma	1
Cyst	4
Abscess	12
Optic nerve tumour	1
Spinocranial neurinoma	1
Osteoma	3
Plexiform neuroma	2
Unclassified	1
Total	183

Analysis

Age incidence of the 16 cases of intracranial tuberculoma is shown in Table 2.

Table 2—Showing Age Incidence of the Cases of Intracranial Tuberculoma in the Author's Series

Up to 10 years	7 cases
11 to 20 ,, ...	5 ,,
21 to 30 ,, ...	3 ,,
31 years and above	1 case
Total ...	16 cases

Out of the series, 4 patients (25 per cent) were strict vegetarians and the rest (75 per cent) were non-vegetarians. Of these, 4 patients came from high income group (25 per cent), and the rest belonged to indigent classes (75 per cent).

Of the tuberculomas, 6 were located infratentorially (37·5 per cent) and the remaining 10 were supratentorial (62·5 per cent). All the infratentorial tumours were in either of the cerebeller hemispheres. Of the supratentorial tumours, 4 were located frontally of which one was inside the left lateral ventricle (Bagchi, 1957). Three were in the parietal region and one in the region of the 3rd ventricle (diagnosed at autopsy). In one case six small and discrete tuberculomas were present in the right temporal lobe, the patient had associated pulmonary tuberculosis. In one patient the tumour was in the occipital lobe. The location of tuberculoma in the author's series is shown in Fig. 1.

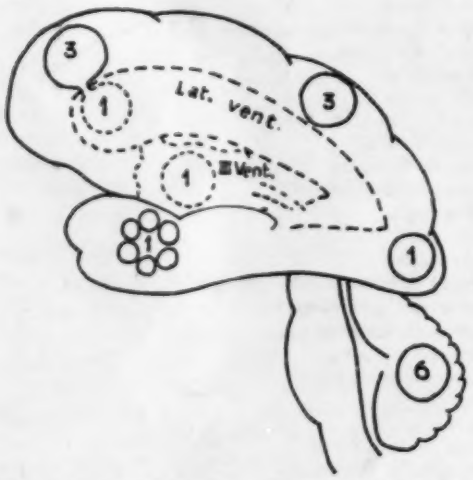

Fig. 1—Showing Location of Tuberculomas in the Author's Series

All the cases presented with the classical features of increased intracranial tension. History of contact with open cases of pulmonary tuberculosis were present in three cases (18·75 per cent). Only one patient had concomitant pulmonary tuberculosis (6·25 per cent). The erythrocytic sedimentation rates were raised in all the cases. The localisations were done through clinical neurological examination and with the help of electroencephalography, cerebral angiography, and ventriculography, but none of the above investigations were helpful as regards pre-operative determination of the pathological nature of the lesions (Figs. 2 and 3, *vide* Plate).

During operations, in 2 cases the tumours were found adherent to the meninges and produced initial confusion because they looked somewhat like fibroblastic meningiomas, but on exploration of the deeper parts of the tumours, typical caseous material came out, thus establishing the macroscopic identity. In general all the tuberculomas were more or less avascular, hard and gritty. In majority of the cases there were no planes of cleavage between the brain and the tumour masses excepting in the case where the tumour was located in the left lateral ventricle. Fig. 4 (*vide* Plate) demonstrates the ventriculographic defect and Fig. 5 (*vide* Plate) demonstrates the macroscopical nature of the operated specimen cited above.

In all of our cases the operations were made under cover of intensive antituberculous therapy and the treatment was continued after the operation for adequate periods. Of the 15 patients operated, 9 survived the operation (60 per cent) and have been keeping well.

The 16th case was diagnosed at autopsy. It is interesting to note that before the discovery of the antituberculous antibiotic and chemotherapeutic drugs the results of operation on tuberculomas were very disappointing. In a series of 17 operated tuberculomas reported by Van Wagenen (1927) only one patient lived one year after the operation.

Discussion

In our series of 183 histologically verified brain tumours there were 16 tuberculomas. In comparison to the incidence of tuberculomas in Southern India ours is certainly less.

The incidence of tuberculomas has sharply fallen in Europe and U.S.A., but in the South American and African countries it is still high. Obviously the rigid and successful control of pulmonary tuberculosis in Europe and U.S.A. is directly responsible for the fall in the incidence of tuberculomas of the brain in those countries.

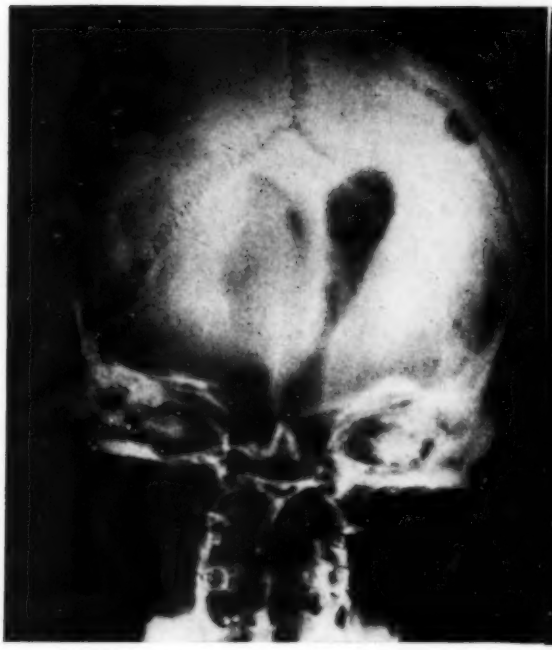

Fig. 2—Showing abnormal ventriculogram of a right frontal tuberculoma.

Fig. 3—Showing abnormal ventriculogram of a right occipital tuberculoma.

Fig. 4—Ventriculogram showing tuberculoma in the left ventricle

Fig. 5—Showing well differentiated outline of the operated specimen of tuberculoma.

BAGCHI—*The Intracranial Tuberculomas* (*p. 429*)

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Fig. 1—Showing bilateral opacity in the lung fields.

Fig. 2—Showing rarefaction of the left acetabulum with condensation of its margin and erosion of articular surfaces.

BERRY —*Extrapulmonary Tuberculosis (p. 436)*

Fig. 1—Showing wasting of the small muscles of the left hand.

Fig. 2—Showing opacity in the apex of the lung and subclavicular area with destruction of 2nd rib (left side).

Fig. 3—Tomogram showing opacity in the apex of the left lung.

MAJUPURIA AND SAKSENA—*Pancoast Tumour (p. 452)*

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PNEUMOCONIOSIS

M. S. KAPUR, B.SC., M.B.B.S.

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The dust that the coal miner breathes is very complex and is intimately mixed up with minerals, silica, carbonates, sulphates and sulphides, most of the particles being between 0·1 μ to 0·5 μ. The lung is black with areas of consolidation and spongy emphysema. In advanced cases the consolidation may extend over the entire lung surface. Microscopically, the alveoli are full of monocytes, the cytoplasm of which is packed with dust. Similar cells are seen in lymphatic channels and lymph nodes at the root of the lungs. There is an increased fibrosis and formation of fibrous nodules—the fibres run in all directions and are radially disposed around a dust focus. The fibrous nodules are collection of dust cells.

Increased incidence of pneumoconiosis in our country is due to many industrial development. Treating exclusively coal miners in this hospital, an attempt is being made to present scientific data of twenty-one cases spotted out last year. In making some critical scientific studies of these cases, it may be underlined that they form no part of any dust-diseases survey on physically active workers of the coal mines. In fact they are cases who had complained of distressing symptoms during their daily discharge of official duties and required admission for investigation and treatment. It thus provided an opportunity to study the complications rather than the disease alone.

MATERIAL AND METHOD

21 colliery workers admitted to Central Hospital, Dhanbad, during the year 1960, form the subject material in the present series. A detailed study of clinical symptomatology and laboratory investigations done on them are shown in Table 1.

ANALYSIS OF MATERIAL

AETIOLOGY :

Sex—20 cases were male and one female. The sex ratio of 20 : 1 is of no significance, since by regulations females working in mines are not underground workers, but are employed only on the surface. Nevertheless, this fact does not exclude them from running the risk of getting pneumoconiosis in mild or moderate form.

Age of the collier and period of service—The youngest patient was 30 years and the oldest 55 years, average being 43·8 years. Exact period of service could not be correctly determined. Only the date on which a person started his work in the last coal mine from which he was referred for treatment can be gathered. All of them, however, admitted having been working in various collieries since attaining majority i.e. about the age of 20 years. Hence an indirect conclusion may be that they were engaged in colliery work from 10—30 years.

Occupation—There was no relative preponderence of disease in any particular type of occupation, amongst the coal miners.

PRESENTING SYMPTOMS :

Dysponea (100 per cent)—It was presented in all cases. It was in fact one of the earliest difficulties that was experienced by these patients both in and outside duty hours.

Cough (90 per cent)—It was present in 20 cases. The cough was productive in all cases, worse during early hours of the morning. The expectoration was a greyish black mixture in the purulent expectoration. Six patients suffered from repeated attacks of bronchspasm at times.

Fever (47 per cent)—It was present in 10 cases ranging from 100-103° F. and was the chief complaint at the time of admission.

TABLE 1—SHOWING PRESENTING SYMPTOMS AND SPUTUM AND BLOOD EXAMINATION REPORT

Name, age & occupation	Presenting symptoms				Sputum for A.F.B.	E.S.R. mm/1st hour	Leucocyte count				
								Differential			
	Cough	Dyspnoea	Fever	Haemoptysis			Total	Neutro	Lympho	Mono	Eosino
S.D., 44, night guard	+	+	+	+	–	18	8,400	69	14	0	17
B.B., 40, tramer	+	+	–	+	–	104	20,500	89	11	0	0
C.L., 36, coal loader	+	+	+	–	–	120	8,600	76	13	0	11
N., 45, loading munshi	+	+	–	+	–	83	28,200	92	8	0	0
R.M., 49, miner	+	+	+	–	–	35	14,800	82	18	—	—
B., 45, loading kamin	+	+	–	–	–	3	8,000	74	20	1	5
K.L., 48, coal cutter	+	+	–	–	–	2	7,750	66	29	1	4
M.R., 50, C.P. miner	+	+	–	–	–	45	19,750	85	10	5	—
D.R., 45, driller	+	+	+	–	–	32	8,000	60	35	1	4
R.P., 50, miner	+	+	–	–	–	34	8,600	78	18	—	4
S.M., — coal cutter	+	+	–	+	–	—	—	83	14	—	3
L.O., 35, coal cutter	+	+	+	–	–	55	18,800	40	10	—	50
J.H. 30, drill helper	+	+	+	+	–	92	15,800	86	14	—	—
R.B., 38, fitter mistry	+	+	+	+	+	86	14,500	84	15	1	—
D.P.S., 30, clerk	+	+	+	–	–	50	23,500	89	8	1	2
N., 45, mistry	+	+	–	–	–	26	8,200	59	28	1	2
P.M., 40, munshi	+	+	–	–	–	101	13,700	84	13	3	—
G., 35, miner	+	+	+	+	–	40	11,400	58	20	1	21
K., 55, P. attendant	+	+	+	–	–	40	16,500	85	11	1	3
A.M., 45, machine driver	+	+	–	–	–	5	16,200	86	13	—	1
B.B., 52, mining sardar	–	+	–	–	–	37	12,500	81	15	2	2

Haemoptysis (33 per cent)—7 patients had haemoptysis from moderate to severe degree.

Anasarca (9·5 per cent)—2 patients had general anasarca and other symptoms of right ventricular failure.

Other symptoms—One had pain over the precordium, although no abnormality was detected in the heart.

PHYSICAL FINDINGS :

The physical findings varied from case to case. The common findings being emphysematous chest, restricted respiratory excursions of the chest wall, diminished vocal fremitus, crepitations of various degree—most marked at the bases, diffuse rhonchi and signs of cavitation. Signs of congestive cardiac failure were present in two cases, and clubbing of fingers in one case only.

INVESTIGATIONS :

Radiological findings—7 patients had micronodular opacities over the entire lung field, four patients had micronodular opacities distributed over most of the lung fields, four patients had punctate opacities covering the whole of lung field, three patients had large opacities between 1-5 cm. and two patients had punctate opacities over less than 1/3 of the lung fields. The radiological findings are shown in Table 2.

Sputum examination—A.F.B. were found in one case only who had pulmonary tuberculosis complicating pneumoconiosis.

E. S. R. (Westergren method)—The maximum E. S. R. was 120 mm. 1st hour, and the lowest was 2 mm. 1st hour, the average being 46·9 mm. 1st hour.

Leucocyte count—It showed moderate leucocytosis with relative increase of neutrophils in all the cases.

COMPLICATIONS :

Emphysema—Although clinically present in almost all cases it was marked in seven (33 per cent).

Tuberculosis—It was present in 10 cases, (48 per cent).

Significant pleural reaction—It was present in four cases (20 per cent).

Cor pulmonale—It was present in 3 cases (14 per cent).

Marked abnormalities of the hilar shadow—It was present in 2 cases (9·5 per cent).

Cavitation—It was present in 2 cases (9·5 per cent).

Bronchiectasis—It was present in 2 cases (9·5 per cent).

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TABLE 2—SHOWING RADIOLOGICAL FINDINGS OF CHEST

Name	Linear opacities	Small opacities 'P' 1	'P' 2	'P' 3	'm' 1	'm' 2	'm' 3	'n' 1	'n' 2	'n' 3	Large opacities A	B	C	Complications
SD	+	+	–	–	–	–	–	–	–	–	–	–	–	Emphysema and bronchiectasis
BB	+	–	–	–	–	+	–	–	–	–	–	–	–	—
CL	+	–	–	+	–	–	–	–	–	–	–	–	–	—
N	+	–	–	+	–	–	–	–	–	–	+	–	–	Emphysema and tuberculosis
RM	+	–	–	–	–	–	+	–	–	–	–	–	–	Tuberculosis
B	+	–	–	–	–	+	–	–	–	–	–	–	–	Cor pulmonale
KL	+	–	–	+	–	–	–	–	–	–	–	–	–	Pleural reaction with bronchiectasis
MR	+	–	–	–	–	–	+	–	–	–	–	–	–	Cor pulmonale
DR	+	+	–	–	–	–	–	–	–	–	–	–	–	—
RP	+	–	–	–	–	–	–	–	–	–	–	–	–	Prominent hilar shadow
SM	+	–	–	–	–	–	+	–	–	–	–	–	–	Emphysema and tuberculosis
LO	+	–	–	–	–	+	–	–	–	–	–	–	–	Emphysema
RB	+	–	–	–	–	–	–	+	–	–	–	–	–	Tuberculosis and pleural reaction
JH	+	–	–	–	–	–	–	–	–	+	+	–	–	Tuberculosis
DPS	+	–	–	–	–	–	–	–	–	+	–	–	–	Tuberculosis
N	+	–	–	–	–	+	–	–	–	–	–	–	–	Emphysema and tuberculosis
PM	+	–	–	–	–	+	–	–	–	–	–	–	–	Tuberculosis
G	+	–	–	–	–	–	–	+	–	–	–	–	–	Tuberculosis and cavitation
AM	+	–	–	–	–	–	+	–	–	–	–	–	–	Tuberculosis, emphysema, cavitation and pleural reaction
BB	+	–	–	–	–	–	+	–	–	–	–	–	–	—
K	+	–	–	–	+	–	–	–	–	–	–	–	–	Emphysema

X-ray findings have been recorded according to "International classification of persistent radiological opacities in the lung fields provoked by the inhalation of mineral dust—*vide* Meeting of Experts on the International Classification of Radiography of Pneumoconiosis"—*Journal of Occupational Safety & Health;* April-June 1958, Geneva I.L.O.

'P'=punctiform opacities of about 1·5 mm. size. 'm'=micronodular opacities of the size 1·5-3 mm. 'n'=nodular opacities of the size 3-10 mm.

Category 1—at least anterior rib spaces and not more than 1/3 of the two lung fields. *Category 2*—distributed over most of the lung field. *Category 3*—profuse opacities covering whole of the lung fields.

DISCUSSION

Twenty-one cases of pneumoconiosis are discussed. This however does not throw much light on the incidence of the disease in India, but certainly it shows some aspect of the complications associated with the disease. The age old idea of pulmonary tuberculosis being more common among the mining population is true, the incidence being 48 per cent in the present series. There is no Indian reference on that subject to author's knowledge. It was sometimes believed that coal dust protects the lungs from tuberculosis and the coal-miners do not develop miners' phthisis. This however has been amply disproved by various workers. In our series heart failure cases had worked for several years in the dusty atmosphere. Respiratory infection was present in majority of the cases as evidenced by fever, purulent sputum, raised E.S.R. and leucocytosis. Lobar pneumonia was found to be the commonest respiratory disease in our miners, more so in winter months because of poor living conditions. Such cases on clinical improvement with antibiotics, sulphonamides, etc., were discharged without radiographic examinations—thus concealing the malady of pneumoconiosis.

SUMMARY AND CONCLUSION

Twenty-one cases of pneumoconiosis are discussed with special reference to complications associated with the disease. Pulmonary tuberculosis was present in 48 per cent of patients suffering from pneumoconiosis.

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EXTRAPULMONARY TUBERCULOSIS

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Extrapulmonary tuberculosis, i.e., tuberculosis of organs other than lungs has seldom been given the importance that is its due. Workers in tuberculosis in India have mostly confined themselves to pulmonary tuberculosis, and extrapulmonary tuberculosis has seldom found a place for discussion at the annual conferences (Editorial, *Indian J. Tuberc.*, 1958). Unlike pulmonary tuberculosis,, it manifests itself in different disciplines of medical practice and is seldom seen in its unity and continuity except by the general practitioner or the paediatrician.

Though abdominal tuberculosis, cervical adenitis and tuberculosis in some other situations may be the result of a tuberculous primary complex or its direct progress to adjacent organs, as in some cases of tuberculous pleurisy and pericarditis, most of the extrapulmonary manifestations of tuberculosis are the result of haematogenous spread.

As stated by Rich (1950), occurrence of bacillaemia has been repeatedly demonstrated during primary infection in the experimental animal as well as during the evolution of primary infection in man. The results of this transient bacillaemia of primary infection are recognisable in the form of tubercles which are seen as a few small encapsulated caseous or calcified nodules in distant organs in subjects with healed primary complex. Most of these lesions, which are part of evolution of primary complex, remain quiescent and unnoticed for considerable periods of time, though they contain viable bacilli. These bacilli may become reactivated during a period of lowered general resistance, or as a result of favourable local condition such as trauma and give rise to clinical tuberculosis of isolated organs. This may come soon after primary complex or after many years. Rich and McCordock (1929) and MacGregor and Green (1937) found majority of cases of tuberculous meningitis caused by reactivation of an older small caseous tubercle, 3 to 5 mm. in diameter in contact with the meninges or a caseous meningeal plaque. Ustvedt and Wagerland (1949) found that majority of cases of genitourinary tuberculosis followed 10 years or more after primary infection. It is also obvious that though the presenting manifestations may be in one organ, it is likely to be associated with tuberculosis of other organs at the same time or in course of time, hence the name chronic disseminated tuerculosis given to it is well justified. Sometimes it is possible to demonstrate the presence of latent tuberculous foci though no active disease may be present elsewhere. Keppel (1951) described two cases of unilateral tuberculosis of the knee joint in children where the control x-ray of the healthy knee revealed latent foci in the femoral condyle.

It is obvious that this wide dissemination and ability to bide its time can give the disease a very protracted course which may spread over many years and whose fate may not be seen unless follow-up is done for years. The high index of allergy and consequent liability to excessive inflammatory reaction makes the vascular serous membranes very liable to involvement resulting in a high incidence of tuberculous pleurisy, pericarditis, peritonitis, meningitis and synovitis in this type of disease. As in meninges, most of the tuberculous effusions are due to discharge of bacilli, or less often of tuberculoprotein from mostly non-viable bacilli into the serous cavity from an adjacent tuberculous lesion (Rich, *loc. cit.*).

Besides these, there are two other characteristic features of haematogenous form of tuberculosis, one healing by calcification and the other by formation of recurring round pulmonary infiltrates. These infiltrates may be unilateral or bilateral, few in number (discrete miliary dissemination) near the apex or immediately below pleura (corticopleural dissemination) or they may be large in number and scattered all over (disseminated emphysematous tuberculosis) (Pagel *et al.* 1953). Any of these infiltrates may, instead of resolving, go on to progressive pulmonary disease. Some of these features are illustrated in the following case report:

CASE REPORT

Vimlabai, Hindu female, aged 26 (part of her case history was described earlier by Berry, 1952) was examined for the first time on 19-11-1949, when bilateral pleurisy was detected. Later she developed tuberculous peritonitis and tuberculous caecum. She also developed opacities in both lung fields (Fig. 1, *vide* Plate) most of which cleared on administration of streptomycin and P.A.S. for 3 months. The pleural effusion on the right side became loculated to form caseous tuberculous empyema. The patient was discharged on 12-9-1950, but readmitted on 1-5-1951 for loss of weight and fever. Pulmonary opacities were now confined to the left apex. Culture of gastric contents became positive on 19-11-1951. The patient was discharged on 13-1-1952.

Admitted for the third time on 4-10-1952 for fever, pain in the chest and loss of appetite. Skiagram showed

bilateral apical infiltration with loculated empyema on the right side, and small amount of free fluid in abdomen and tender movable mass in right iliac fossa (tuberculous caecum) was present. The patient was discharged again on 31-1-1953.

Admitted for the fourth time on 7-1-1955 with a gluteal abscess at the site of streptomycin injections two years ago. Though she had had pain there for 7 months, the redness, swelling and induration were only of one week's duration. The right inguinal, right axillary and right supratrochlear glands were enlarged. Hb., 65 per cent; E.S.R., 110 mm. Biopsy from the ulcer showed necrotic tissue undergoing calcification.

She was put on P.A.S. 12 g. daily and isoniazid 200 mg. daily.

The ulcer healed up but the fever after initial settling down increased and continued. The patient started complaining of headache and developed rigidity of neck and back. Examination on 23-2-55 revealed clear C.S.F. with no cells and proteins 30 mg./100 ml.; sugar, 43·5 mg./100 ml. and chlorides 685 mg./100 ml. In spite of equivocal findings, streptomycin 1 g. daily was added to her treatment and the daily dose of isoniazid was increased to 400 mg. The fever settled down but on 4-3-1955 she started complaining of pain in the right hip joint in extension and preferred to keep it flexed at 30°. Skiagram of the pelvis on 11-1-1955 (Fig. 2, *vide* Plate) showed the right hip joint to be normal. The left hip joint showed rarefaction of the acetabulum and condensation at its margin. The articular surface of the acetabulum was found eroded and irregular and femoral head showed similar changes. The left sacroiliac joint showed irregular obliteration of joint space and condensation of bone in the area, 4th and 5th lumbar vertebrae showed narrowing of intervertebral space and increased density. Reference to an earlier skiagram taken on 8-12-1952 showed that similar changes, though not as advanced, were present then too, but were missed.

It was surmised that she had tuberculosis of the left hip joint, sacroiliac joints and of 4th and 5th lumbar vertebrae. Skiagram of the pelvis (8-3-55) showed little change from the previous one. On 1-4-1955 she developed tenderness and rigidity in the light iliac fossa and by 13-4-55 a tender fixed mass had developed in the right iliac fossa and was diagnosed as a cold abscess.

Her general condition improved by 29-4-55 and the E.S.R. gradually came down to 30 mm. Pain in the hip became much less though the cold abscess persisted.

She was discharged on 17-7-1955 at her own request. She had received this time 82 g. of streptomycin, besides P.A.S. and I.N.H. in adequate dosage.

She was admitted for the fifth and last time on 13-12-1955 with fever, cough, pain in the abdomen and back and a swelling in the right groin for 20 days. She was also having occasional nausea and vomiting.

She looked pale and was febrile. The abdomen was slightly distended and tender in the right iliac fossa and right hypochondrium. An ill defined lump in right iliac fossa was found fixed and tender.

She started having attacks of abdominal distension and vomiting evidently due to intermittent intestinal obstruction. Her anaemia increased.

On 13-2-1956 during one of her attacks, she had fits with bizarre movements (? functional, ? due to alkalosis, ? cerebral tuberculoma).

C.S.F. examination showed clear fluid with 6 lymphocytes per c.mm., protein 30 mg./100 ml, sugar, 38·4 mg./100 ml., chlorides 610 mg./100 ml. (? tuberculous meningitis).

The patient died of peripheral circulatory failure during an attack of subacute intestinal obstruction on 22-3-1956, more than six years after her illness began.

During this period she showed the following lesions:

1. Bilateral tuberculous pleurisy.
2. Bilateral chronic haematogenous disseminated pulmonary tuberculosis which progressed to discrete miliary disseminated pulmonary tuberculosis.
3. Tuberculous peritonitis.
4. Tuberculous caecum.
5. Tuberculous caseous loculated empyema (rt. side).
6. Tuberculous gluteal abscess and sinus at the site of streptomycin injections.
7. ? Tuberculous serous meningitis.
8. Tuberculous 4th and 5th lumbar vertebrae.
9. Tuberculous sacroiliac joint (left).
10. Tuberculous left hip joint.
11. Cold abscess of right iliac fossa (? from lumbar spine).
12. Tuberculous glands of right groin, axilla and supratrochlear region.
13. ? Tuberculoma brain.
14. Subacute intestinal obstruction.

In her last admission but one, the patient brought her daughter, aged 14, who had developed pleurisy with effusion.

Discussion

The prevalence of extrapulmonary tuberculosis can be determined only by a survey in a random sample of the population. But no such survey has been done and only indirect evidence of its fairly high incidence is available. During 1949 to 1951 Achar (1952) admitted 610 cases of tuberculosis in the paediatric department of General Hospital, Madras, 251 of which were due to tuberculous meningitis. Webb (1956) saw 210 cases of tuberculosis amongst 11658 O.P.D. cases and 1165 admissions in paediatric department of Christian Medical College, Vellore, in 1955; of these 60 were of bone and joint tuberculosis and 27 had tuberculous meningitis. Khandelwal (1960)

found the following incidence (Table 1) of various forms of tuberculosis in children who attended the Medical College Hospital, Nagpur, from November 1958 to October 1959.

TABLE 1—SHOWING NO. OF CASES OF TUBERCULOSIS OF VARIOUS FORMS SEEN IN CHILDREN DURING ONE YEAR IN THE MEDICAL COLLEGE

Type of tuberculosis	No. of cases
Pulmonary tuberculosis	104
Extrapulmonary tuberculosis	266
Tuberculous meningitis	54
Tuberculous abdomen	13
Bone and joint tuberculosis	70
Tuberculous lymphadenitis	109
Choroid tuberculosis	2
Pleurisy	13

Besides these, there were 95 cases of phlyctenular conjunctivitis and 2 cases of erythema nodosum during the same period.

Considering three of the serous membrane manifestations, in the meninges, pericardium and pleura, the number of cases seen over a period of 3 years 1957, 1958 and 1959 in the Medical College Hospital, Nagpur are shown in Table 2.

Tuberculosis is the commonest cause of pleurisy with effusion in patients under 40 years (Editorial, *Lancet*, 1950), and idiopathic pleurisy is commonly seen in the medical wards of any hospital. In a series of 53 cases admitted and followed up in this hospital, 35 cases (66 per cent) had one or other form of extrapleural tuberculosis whether serosal, pulmonary or extrapulmonary (Berry, *loc. cit.*), proving that most of these cases are tuberculous and in the hospital class of patients at least it is not always benign. It may be the forerunner of haematogenous spread elsewhere ; all the more so in cases with bilateral pleurisy and all the 13 cells later developed tuberculosis elsewhere.

Tuberculosis is the commonest cause of pericarditis in this country, accounting for nearly half the cases seen in our hospitals (Berry and Banerjee, 1953, Berry and Banerjee, 1955). Constrictive-pericarditis which may be missed as congestive cardiac failure or cirrhosis of liver is the end result of unresolved tuberculous pericarditis (Andrews *et al*, 1948 ; Betts and Thompson Wells, 1953).

Primary tuberculosis of the abdomen not secondary to pulmonary tuberculosis (whose existence was disputed for sometime) has been proved as an independent entity and it is fairly common (Wig and Bawa, 1953 ; Wig *et al*, 1956, and Berry and Bidwai, 1958). Most of these cases are due to plastic tuberculous peritonitis with or without associated tuberculous mesenteric adenitis. Serous tuberculous peritonitis is next only to pleurisy with effusion in its incidence.

Tuberculosis is the commonest cause of meningitis in Nagpur and it is probably true of the rest of the country. In half the cases tuberculous disease can be demonstrated elsewhere in the body (Berry and Subhedar, 1957). Rammurthi (1958) found tuberculosis to be the commonest single cause of intracranial tumours in Government General Hospital, Madras, forming 21·9 per cent of all verified intracranial tumours. In 68 operated cases of intracranial tumour in Bombay (Ginde, 1955), more than 13 per cent were tuberculoma.

Bone and joint tuberculosis is common in south India according to Ayyar (1948). He describes 1140 cases seen in 3 years (1943-1946) in General Hospital, Madras. Sinha (1958) saw 12,668 cases of bone and joint tuberculosis in 17 years from 1940-1957 in orthopaedic department of Gandhi Memorial Hospital, Lucknow. Both found spine as the commonest site, hip and knee joints coming next in order of frequency.

Tuberculous adenitis is common. In Webb's series it accounted for a quarter of tuberculous children. Sen *et al* (1956) found close association

TABLE 2—SHOWING THE YEAR AND DISTRIBUTION OF DIFFERENT TYPES OF SEROUS MEMBRANE TUBERCULOSIS IN CHILDREN AND ADULTS OF BOTH SEXES

Year	Tuberculous meningitis				Tuberculous pericarditis				Pleurisy with effusion			
	M	F	Ch	Total	M	F	Ch	Total	M	F	Ch	Total
1957	35	38	37	110	1	—	—	1	54	23	2	79
1958	39	68	58	165	1	1	—	2	42	31	11	84
1959	22	46	89	157	7	5	1	13	82	35	45	162
Total	96	152	184	432	9	6	1	16	178	89	58	325

M=male adult, F=female adult, Ch=child.

between cervical adenitis and active primary infection and they found the glandular enlargement generally on the same side as the enlarged hilar and mediastinal (paratracheal) glands. Shivpuri (1956) found cervical adenitis in 55 and axillary adenitis in 44 out of 287 cases of tuberculous hilar and mediastinal adenitis which was part of 'primary complex'.

How silent renal tuberculosis can be was brought home to us recently when one of our students on treatment for tuberculous Addison's disease with chemotherapy and corticoid supportive therapy for 2 years had for the first time painless massive liaematuria. Pyelography showed a non-secreting left kidney and cystoscopy showed not only tuberculous granulation tissue (proved on biopsy) but thick fibrous bands showing that the disease must have existed there silently for a long time. The available figures for renal tuberculosis may be only revealing the top of the iceberg and only a systematic search for it will give the true incidence of the condition. The extensive capillary network in the kidney is expected to trap tubercle bacilli more often than is shown by clinical incidence. But radiolgy is not capable of revealing an early lesion in the kidney.

Though any of these manifestation may be seen at any age they are most common in children and adults, that is during the years following the primary complex and when the resistance is lowered by stress of puberty or of any other form. Berry (*loc. cit.*) found 53 patients among idiopathic pleurisy in the age group 16 to 35 years. Both sexes were affected, but manifestation may be more common in one sex than the other, i.e. preponderance of bone and joint tuberculosis in males (Sinha, *loc. cit.*), and abdominal tuberculosis in females (Wig and Bawa, 1953 ; and Berry and Bidwai, 1958). Of 200 cases of renal tuberculosis reported by Borthwick (1952) over 85 per cent were between the ages of 10 and 40 and there was a much higher incidence of the disease in males.

It is obvious that the protean manifestations in different organs will test the diagnostic skill and ingenuity of the clinician much more than pulmonary tuberculosis. No clinician, whatever his speciality, can be indifferent to tuberculosis. Whatever the presenting manifestation of tuberculosis, systematic search for other tuberculous foci should be made. This is often rewarding. The true nature of the presenting lesion may be revealed only by an associated lesion. Presence of choroid tubercles in an undiagnosed meningitis confirms its tuberculous nature, and also the presence of miliary tuberculosis even if there is no other evidence of the latter. Presence of pulmonary tuberculosis with constrictive pericarditis where the pericardium only shows fibrous scar tissue, as in one of Bett's operated cases (Betts and Thomson Wells, 1953) or thick exudate as in one of our cases (Berry and Banerjee, 1953) reveals the nature of the pericarditis. Establishment of bacteriological diagnosis is axiomatic but is not always possible as in tuberculous serous effusions. Recent advances, as use of pleural and pericardial needle biopsy, liver and sternal marrow biopsy in miliary tuberculosis, more frequent use of synovial biopsy and gland biopsy in bone and joint tuberculosis and use of suction endometrial biopsy in the out-patient clinic, facilitate confirmation of the diagnosis. Often we have to depend on histological presence of caseation for diagnosis. But it is clear that before a patient is put on prolonged chemotherapy and still longer surveillance extending over years, the clinician must make every effort to establish the diagnosis convincingly.

The treatment will vary with the presenting site of the disease but it is obvious that in all cases of haematogenous manifestations, two things are essential, (1) prolonged chemotherapy, at least for a year, probably more, and (2) the patient must be kept under observation for a long period for appearance of tuberculous disease elsewhere in the body and the clinician must always bear this in mind. Medical Research Council (1955) has shown that a combination of two drugs should be used throughout the course of treatment to prevent development of resistant strain. Their conclusions with regard to the initial advantage of a combination of streptomycin (1 g.) and isoniazid (200 mg.) daily in earlier control of toxaemia over a combination of PAS (19 to 20 g.) and isoniazid with similar long term results in case of pulmonary tuberculosis can be applied in general, unless and until additional evidence to the contrary becomes available. Dick (1953) has shown that in the case of renal tuberculosis, isoniazid diminishes the development of fibrosis and promotes absorption of caseation and vascularisation of edges of a tuberculous lesion. This may be true of other tissues also. Because of the advantages of higher concentration in exudates, C.S.F. and intracellular penetration, isoniazid should form one of the two drugs used for chemotherapy.

All measures for the prevention of tuberculosis in general will tend to diminish the incidence of extrapulmonary tuberculosis, but two developments deserve special mention. Firstly, low virulence for guineapig of majority of tubercle bacilli isolated in sputum-positive cases in Madras (provi-

ded this is also true of the rest of the country) as compared with tubercle bacilli isolated in Western countries (Mitchison, 1960) gives hope that raising of general resistance by improving nutrition and housing conditions of the population and of specific resistance with B.C.G. inoculation should be more effective here than in Western countries, in diminishing the incidence of tuberculosis.

Secondly, according to Wallgren (1957), B.C.G. vaccination prevents direct complications of a virulent primary infection such as clinical primary tuberculous meningitis, miliary tuberculosis, early post-primary tuberculosis and pleurisy. As more than 150 million people have been tuberculin tested and more than 50 million have been B.C.G. vaccinated since 1951 with the purpose of achieving Mantoux conversion in the majority of the Mantoux negative population in India by the end of second five-year plan in March 1961 (Benjamin 1959), the incidence of the extrapulmonary tuberculosis will fall in this country.

Summary and Conclusion

1. Extrapulmonary tuberculosis is the result of reactivation of tuberculous foci formed in organs as a result of bacillaemia which in most cases is a part of the evolution of primary infection with tubercle bacilli. Rarely, it may be the result of breakdown of a tuberculous gland or a focus into a vessel or due to formation of tuberculous endangiitis.

2. Wide haematogenous dissemination of tuberculous foci in the body and the ability of these foci to remain latent for a long time give the disease its protracted course and make its ultimate prognosis uncertain. Tuberculosis of different organs may appear simultaneously or in rapid succession or it may be separated by long quiescent intervals of many years.

Excessive tendency of involvement of serous membranes such as pleura, peritoneum, pericardium, meninges and joints with exudate formation, formation of pulmonary infiltrates and healing by calcification when unresolved, are the other characteristic features of these lesions.

3. In the absence of a 'prevalence survey', one has to depend on the hospital figures for estimation of the incidence of the disease. Various reports in this country indicate that extrapulmonary tuberculosis involving pleura, pericardium, meninges, brain, bones and joints, lymph glands and abdomen is fairly common.

4. Extrapulmonary tuberculosis is commonest in children and also in the age group 15 to 40 years. Tuberculous abdomen is more common in females while renal tuberculosis and bone and joint tuberculosis are more common in males.

5. Apart from local treatment, all cases with any manifestation of extrapulmonary tuberculosis should be given the benefit of combined antituberculous chemotherapy uninterruptedly for a period of at least one year, preferably more. One of the drugs in combination should be isoniazid.

These cases should be followed up for at least five years after the last manifestation of tuberculous activity.

6. It is hoped that with B.C.G. prophylaxis and improvement in economic conditions, the incidence of extrapulmonary tuberculosis will fall steeply in our country.

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EXTRAPULMONARY TUBERCULOSIS IN GENERAL PRACTICE*

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Extrapulmonary tuberculosis in its various forms is a local manifestation of tuberculosis elsewhere in the body. While a specialist treats the local disease in his own way, it is the duty of a general practitioner to treat the disease and the patient as a whole. With the advent of specific anti-tuberculous drugs, the prognosis in many of these cases has changed a lot and hence it has become imperative on our part to diagnose them early.

TUBERCULOSIS OF SEROUS MEMBRANES

Tuberculosis of serous membranes is common, pleura, peritoneum and pericardium being affected in that order of frequency. If the case presents itself with the usual signs and symptoms, either of dry pleurisy or of pleurisy with effusion, difficulty in diagnosis does not arise. But if the onset is insidious and the fluid accumulates slowly, the case proves to be a problem to a practitioner.

Having made the diagnosis of pleurisy with effusion, it is important to bear in mind that it is either an extension of a lesion in the lungs or is a part of generalised tuberculosis. Treatment of pleurisy is the treatment of tuberculosis. Chemotherapy is very important both from the point of view of clearing the pleural process and the pulmonary component which is usually present. In addition, it prevents the spread of tuberculous process in the glands, bones, kidneys and central nervous system.

Tuberculous peritonitis occurs as a result of extension of infection from mesenteric glands or bowel ulceration or it may be a part of generalised dissemination. Chronic and subacute types with their vague abdominal symptoms like pain, tenderness, constipation alternating with diarrhoea and tympanitis cause a real headache to the practitioner. Chronic amoebiasis is a very common malady in our country, and its vague abdominal symptoms may be confused with those of tuberculosis. The confusion becomes worse if the two diseases coexist. Though amoebiasis is the disease of colon and tuberculosis affects mesenteric glands, small intestines and the caecum, it is the vagueness of symptoms that causes the confusion. If two to three weeks of intensive anti-amoebic treatment fails to give an adequate response, the case should be thoroughly investigated to establish the diagnosis.

Tuberculous pericarditis, with or without effusion, was once thought to be a rare disease but now it is not considered so uncommon in our country.

Treatment of tuberculous peritonitis or pericarditis is essentially the treatment of tuberculosis except where surgical intervention is required to meet the complications.

TUBERCULOSIS OF LYMPH GLANDS

Lymph gland tuberculosis is very commonly seen in general practice especially the cervical variety in children. These children are brought to us with fever and one or two lymph glands near the angle of jaw enlarged and tender. With a short treatment for a week with sulpha drugs or penicillin, they get better. These children get similar attacks off and on, and with each attack more and more glands get enlarged and in a matter of few months a chain of enlarged glands appears on either side of the neck. It is really very difficult to distinguish between chronic sepsis and tuberculosis. Whatever the nature of infection, tonsils and infected carious teeth are the usual foci. Family history and history of contact, especially if it is positive, may be quite useful in diagnosing some cases. Total and differential leucocytic counts, erythrocyte sedimentation rate and Mantoux test give us a clue to the diagnosis. A word about needle biopsy of lymph glands will not be out of place here. It is very simple and yet a very valuable procedure which can be easily carried out in our dispensaries. Acid-fast bacilli may be detected in a good number of cases.

Treatment of this condition is to improve the general health of the patient by calcium, vitamin D, proper diet and correcting anaemia. Foci of infection should be removed early. A few injections of penicillin post-operatively should be given. Anti-tuberculous drugs should be used only in those cases where the diagnosis is beyond doubt and the infection is likely to spread to other glands

*Read at the Symposium on Extrapulmonary Tuberculosis, Nagpur, August 14, 1960.

or become generalised and where there is poor response to general measures of treatment.

Tuberculosis of mediastinal glands is a distinct clinical entity described in textbooks but it is not diagnosed in practice so often, and it may, therefore, be inferred that either this condition is not so common or it is missed for attacks of bronchitis, bronchopneumonia or whooping cough, which are so commonly seen.

Tuberculosis of mesenteric gland has already been mentioned. While diagnosing palpable mesenteric glands, one should make sure that they are not faecal masses and that one should be able to palpate them at the same spot on successive days when the bowels are quite empty. It is much more difficult to palpate these glands in children, particularly when they are crying and keeping the abdomen tense.

Axillary lymph glands are quite often enlarged and palpable either through direct lymphatic spread from tuberculous glands in the neck or due to tuberculous lesion in the catchment area. Similarly, epitrochlear, popliteal or inguinal glands get involved due to lesions in their respective areas.

Generalised forms of tuberculous lymph adenitis is caused by infection spreading through blood stream. It has to be differentiated from syphilis, leukaemias, lymph-adenoma and lymphosarcoma by blood examinations and gland biopsy which can be more easily carried out in a hospital. The disease being widespread, the outlook is not so good as it is in the localised forms. There are more chances of serious complications taking place and hence the treatment has to be more prompt, persistent and prolonged.

Some of these glands may go on to caseation, necrosis and abscess formation, which had to be drained appropriately in order to avoid persistent sinus formation and development of recurrent cold abscesses. These glands may require excision followed afterwards by full course of anti-tuberculous drugs and general measures of treatment.

Generalised Forms of Tuberculosis

Acute miliary tuberculosis is commonly seen in infants, young children and young adults. It may affect persons in perfectly good health or there may be evidence of tuberculosis somewhere in the body. Onset is similar to any condition producing pyrexia with aches and pains, sweating and general weakness. But the condition is not amenable to usual drugs, e.g., quinine, sulpha drugs, penicillin or broad spectrum antibiotics. After a week or two, there may appear some localising symptoms, particularly where the tubercles are predominant, like hacking cough, dyspnoea, cyanosis in case of lungs or pain, distension of abdomen and constipation in case of peritoneal involvement. Physical signs being those of general toxicity, there is no other pyrexia which can confuse and confound a general practitioner than this. It takes some time before the miliary shadows can be seen. Once the miliary tuberculosis is diagnosed, the treatment has to be vigorous and prolonged. Aim of the treatment should be not only to cure the condition but to prevent, if possible, the most serious complication of tuberculous meningitis.

Subacute and chronic forms, being more vague in their manifestations, are more difficult to diagnose. One should recognise the existence of these forms, suspect them in proper cases and try to diagnose them with the help of radiology.

Tuberculous Meningitis

The onset of this disease in children of younger age group is usually very sudden. In case of older children and adults, the onset is more insidious and hence one has to be constantly vigilant and be on the look out for any development of severe headache, vomiting, irritability or rigidity of neck. Lumbar puncture should be done to establish the diagnosis whenever it is suspected.

Early diagnosis is not only important from the mortality point of view but it can also prevent the development of block in C.S.F. circulation and also the constriction of the cerebral vessels by exudate and thus prevent sequelae.

With the use of chemotheraphy in time, not only can the patient be saved but he may be able to lead a normal life after full recovery.

Genito-urinary Tuberculosis

Tuberculous epididymitis may present itself either as a case of scrotal sinus discharging thin pus with epididymis and testes adherent to the skin or as a scrotal swelling without abscess formation. The condition is seen in those persons who have either suffered from tuberculosis previously or who show evidence of active tuberculosis elsewhere in the body. Epididymis shows a nodular swelling which is hard and tender and which may ultimately break down to abscess formation. Vas deferens may be thickened or sometimes beaded. General condition of the patient may be apparently quite normal or there may be history of low grade fever and general debility. This condition has to be differentiated from gonococcal epididymitis which is the commonest condition seen in general practice. It presents itself in a more acute form with scrotum red, hot, swollen and tender. There is urethral discharge of pus which

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may show gonococci. The whole epididymis is large, hard and tender. Usually the whole cord also is swollen and tender.

Tuberculous epididymitis is not an isolated affection. It is usually accompanied by tuberculosis of prostate, urinary bladder and even the kidneys, which may not be quite obvious clinically, response to antituberculous drugs being not very encouraging and as they are not likely to effect a complete cure, surgery in conjunction with the drugs is the treatment of choice. The epididymis is excised and sometimes the testis along with it.

Tuberculosis of kidneys and urinary bladder is difficult to diagnose clinically. It may at the most be suspected in cases which come with haematuria or dysuria for which there is no obvious cause or acid fast bacilli may be detected accidentally on urine examination. Anti-tuberculous drugs in conjunction with surgery should be the treatment of choice.

Tuberculosis of Bones and Joints

Early accurate diagnosis of bone and joint tuberculosis is difficult. Patient's history will often help the diagnosis. Attention should be directed to the history of onset, duration of symptoms, any loss of weight or energy. History of injury to the part affected is usually available. In a tuberculous joint, pain and tenderness are slight at first, the characteristic features being limitation of full range of movements and some swelling. If one observes closely how the patient stands, walks, sits or lies down, one may get a clue. It is the caution in movement and loss of function that come earlier than pain. Even radiography is not helpful in early diagnosis. Regional lymph node biopsy may be useful in some cases.

Anti-tuberculous drugs hold promise in bone and joint tuberculosis but they have their limitations, for it is doubtful whether they can reach the avascular tissues in sufficient strength to be really effective against *Mycobacterium tuberculosis*. Surgical procedures still play an important role in the treatment of bone and joint tuberculosis.

Rehabilitation

Treatment of tuberculosis cannot be complete unless it includes the rehabilitation of the patient. The Government and other organisations doing social work may be doing this in their own way but we, practitioners, individually can do quite a lot for our patients. Nothing can give more joy to a doctor than seeing his patient well settled in life after a grim struggle with a disease like tuberculosis.

EXTRAPULMONARY TUBERCULOSIS

Incidence, Diagnosis and Management*

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Classification

Extrapulmonary tuberculosis can be classified into the following groups:

I. Tuberculosis of the central nervous system:
   1. Tuberculous meningitis.
   2. Tuberculoma.
   3. Tuberculous encephalopathy (so-called).
   4. Tuberculous polyneuritis (rare).

II. Tuberculous lymphadenopathy:
   1. Local.
   2. Disseminated.

III. Intra-abdominal tuberculosis:
   1. Enteritis.
   2. Mesenteric and retroperitoneal lymphadenopathy.
   3. Peritonitis: (i) plastic/adhesive.
      (ii) ascitic.
      (iii) ulcerative/caseous.
   4. Liver and Spleen.
   5. Fistula in ano.
   6. Any combination of above.

IV. Skeletal tuberculosis.

V. Genito-urinary tuberculosis.

VI. Dermal tuberculosis:
   1. Lupus vulgaris.
   2. Primary tuberculosis ulcers.
   3. (?) Erythema nodosum.
   4. Scrofuloderma.

VII. Ocular tuberculosis:
   1. Chorioretinitis.
   2. (?) Phlyctenular keratitis.

VIII. Otitic tuberculosis.

* Read at the Symposium on Extrapulmonary Tuberculosis, Nagpur, August 14, 1960.

IX. Oral tuberculosis.

X. Tuberculous pericarditis, constrictive pericarditis.

XI. Miliary tuberculosis:
1. Acute.
2. Chronic.

XII. Miscellaneous, including congenital tuberculosis.

Extrapulmonary tuberculosis may be primary or secondary. Primary infection may be either in lymph glands, abdomen or skin. Earlier incidence of measles, whooping cough or acute illness may be responsible for lowering the resistance to tuberculosis.

Incidence

Incidence varies with the circumstances and chances of exposure. Poverty, overcrowding, poor hygiene, existence of open cases of tuberculosis and contacts are conducive to the incidence of infection. Some families are known to be more susceptible than others. Lack of education and health rules also are responsible. There is high prevalence of tuberculosis in India for which little or no specific medications are available. For effective control of tuberculosis, specific guidance is needed after planned short- and long-term studies.

Incidence of infection in children varies from place to place and may show great variations. Severity of tuberculosis in very young children is well-known, and morbidity below four years is very high. 78 per cent of deaths in children below two years is due to extrapulmonary tuberculosis, while it is 39 per cent in children above three years. Incidence of extrapulmonary tuberculosis is 5 to 7 per cent. Mortality of infection in children below one year is 21 per cent, below 5 years 25 per cent and below 10 years 27 per cent. Children exhibiting extensive pulmonary tuberculosis on first examination have much more demonstrable dissemination either in meninges, bones, lymph glands or as acute miliary spread. It occurs more in children between six months and three years. The danger period for dissemination is the first three months, decreasing up to one year after the primary infection. It takes five to eight weeks for sensitisation to develop against tubercle bacilli and majority of miliary tuberculosis and tuberculous meningitis cases occur within three months of sensitivity. Incidence of skeletal tuberculosis is higher in infected children of young age groups and most deaths from tuberculous meningitis and miliary tuberculosis occur in the early course of the disease. 5 to 10 per cent mortality was found in children from extrapulmonary tuberculosis under three years of age and 3 per cent in tuberculous meningitis. It was 24 per cent below the age of six months but only 5 to 6 per cent between 5-18 months. Sex is not of much importance in younger age group. Circumstances leading to discovery of infection such as illness of the patient, incidence in the family and tuberculous infection anywhere are important considerations. Quite often on routine check-up one may find tuberculous infection. Interval between the discovery of infection and onset of extrapulmonary manifestation is important.

Tuberculosis is an important socio-economic problem in our country and it is closely linked with health education, health consciousness and preventive awareness. The age has an important bearing in the course of primary complex. From the age of 2-5 years generalised spread is less marked though this can frequently be seen. Infection is confined usually to tracheobronchial glands from the age of 6-10 years. Dissemination at this age tends to be solitary although considerable local damage occurs to bone and joints. In later childhood local spread and isolated dissemination are more frequently seen.

The incidence of extrapulmonary tuberculosis based on various planned studies in various countries has been estimated as follows:

Miliary and meningeal	...	8 per cent
Acute miliary	...	34 per cent
Tuberculous meningitis	...	13 per cent
Bone tuberculosis	...	15 per cent
Abdominal tuberculosis	...	7 per cent
Otitic tuberculosis	...	5 per cent
Tuberculous adenitis	...	18 per cent

Diagnosis

There may not be any clinical evidence of tuberculosis, but on routine radiological examination or tuberculin testing, one may be able to spot out the case.

Tuberculin test if properly carried out is of great value. Below the age of six months tuberculin sensitivity shows definite activity of tuberculosis. Between six months and three years, it is presumptive. A negative tuberculin test with a fresh material is conclusive proof of absence of tuberculosis. False negative tests may occur in acute infectious fever, acute infections, in extreme stage of any illness, after measles, after whooping cough, etc., and there may be negative phase for

three to eight weeks after the infection. Prolonged use of antituberculous drugs might make it negative. Use of drugs like antihistaminics and cortisone may give negative results.

0·1 ml. of O.T. containing 0·1 mg. = 0·1 ml. of P.P.D. containing 0·0001 mg.

Patch and jelly tests and Heaf's multiple puncture test are not so reliable. Mantoux intradermal test properly carried out is significant.

Fluoroscopy alone is not always very reliable. In cases of suspected miliary tuberculosis and other doubtful cases, one should insist on a proper x-ray examination. Examination of gastric content for tubercle bacilli done by concentration method on three consecutive days is of value. Some workers have found out cough swab to be of great value. Cerebrospinal fluid examination, careful examination of cobweb and guinea-pig inoculation are useful. Lymph gland biopsy, peritoneal, pleural or pericardial exudate examination, smear examination, routine blood examination, erythrocytic sedimentation rate estimation, synovial and skin biopsy and weight curve progress studies are helpful.

Tuberculous meningitis—Tuberculous meningitis is a medical emergency but it is the most variable, insidious, deceptive of all diseases. It must be suspected rather than diagnosed. It constitutes 8-10 per cent of the total admissions to the paediatric wards. Commonest age incidence is between six months and three years. Patient may present with a history of change of temperament, disinterestedness in the surroundings, apathy, listlessness, irritability, drowsiness or resentment of interference. There may be sudden convulsions, vomiting and irregular pyrexia. There may be paresis or paralysis of cranial nerves or limbs, or there may be a few or no signs. Quite often there are rapid pulse and irregular respirations. In the infant the anterior fortanelles may be tense, boggy or pulsatile. Brudzinski's sign is more often present than Kernig's. Cerebrospinal fluid may show pleocytosis with diminished sugar and chlorides, and increased protein. There may be cobweb formation. Cerebrospinal fluid picture may vary in treated cases. In tuberculous serous meningitis, there is lymphocytosis and slightly raised protein, but sugar and chlorides are normal .

Tuberculoma is quite a common condition in this country and comparison with western figures is fallacious and misleading. It may be silent or may manifest as local, focal or general signs of an intracranial space-occupying lesion. Mention of so-called tuberculous encephalopathy and polyneuritis are of academic interest.

Intra-abdominal tuberculosis — This needs careful diagnosis and evaluation for therapy. Peritoneoscopy may help in some cases. The abdomen may be doughy or there may be masses or signs of ascites.

Tuberculous lymphadenopathy—More than 35 per cent of the lymph glands of body are situated in the neck. Cervical adenitis is therefore more frequent. The contribution of repeated attacks of tonsillitis and upper respiratory tract infection in flaring up the infection is worth considering. Relationship of cervical adenitis to paratracheal and mediastinal lymphadenopathy is considered to be significant by some. The nodes are discrete, later on get matted, caseated and liquefied. They may burst and produce resistant sinus. Some of them may calcify. Extensive surgical removal is not necessary. Local treatment with a solution of 400 units of streptokinase and 500 units of streptodornase per ml. and use of stronger solutions for packing the cavity help early formation of granulation tissues and healing, leaving only a minimal scar. For recent scars, cortisone ointment is useful. For occasional isolated big tuberculous glands, streptomycin solution can be injected into the glands.

Skeletal tuberculosis—Modern methods of clinical evaluation and diagnosis and understanding of the relationship between primary infection and onset of bone and joint diseases have helped earlier diagnosis, so that excessive damage and disorganisation can be prevented. Tuberculosis of spine and hip-joints are outstanding.

Genito-urinary tuberculosis—Painless haematuria or resistant pyuria in the patient with a suspicious history should arouse suspicion.

Dermal tuberculosis—Lupus vulgaris, scrofuloderma and primary tuberculosis of skin (primary tuberculous chancre), and ? erythema nodosum should be considered.

Oral tuberculosis comprises tuberculous tonsillitis, tuberculous ulcers.

Tuberculous pericarditis—Tuberculous pericarditis is usually secondary to a lesion in the hilar nodes or in the lungs. Pericardial effusion is massive. Constrictive pericarditis should be treated surgically under umbrella of anti-tuberculous drugs after the disease has become quiescent. The results are not always satisfactory.

Miliary tuberculosis—All organs of the body may be involved as any other serous membrane. It may be acute or chronic and may be of typhoid type, pulmonary or meningeal type.

Miscellaneous—Any of the combinations of the above may occur. Congenital tuberculosis may lead to the primary focus in any organ. Ordinarily it is not compatible with life.

Prognosis

Prognosis of extrapulmonary tuberculosis has been materially influenced by the revolutionary progress in therapy. Hitherto a very dangerous and fatal disease, it has come within the range of cure by judicious administration of combined therapy with or without steroid treatment. Prognosis depends on the type of lesion, severity of disease, early diagnosis, nutritional status of the patient and proper institution of therapy.

Management

B.C.G. vaccination if done on the newborn is very useful. In tuberculin negative cases it may help to develop immunity and help to convert them into tuberculin reactors. It has been well established that successful B.C.G. vaccination protects against the incidence of tuberculosis in a person who has not developed a natural primary infection and is living in a community where there is a reasonable chance of infection.

The notion about therapy in tuberculosis has undergone significant metamorphosis during the last decade. The old regime of bed rest, diet, fresh air and collapse therapy has undergone revolutionary changes. It is generally expected that chemo- and antibiotic therapy must be combined, continuous and prolonged. Streptomycin has its effect on vestibular divisions and dihydrostreptomycin on cochlear divisions of 8th nerve. In India it is remarkable that we do not find these symptoms so common in the child population even on prolonged and intensive therapy. Drug resistance and fever are met with. 20-25 mg. per lb. of body weight per day intramuscularly is recommended for a long period. 10-50 mg. may be given intrathecally, though this is not favoured by us. Isonicotinic acid hydrazide 5-10 mg. per lb. of body weight per day orally is administered. INH is metabolised in the body by acetylation mechanism which renders it therapeutically inactive and there is evidence that the rate of acetylation varies appreciably in different individuals. PAS slows down the rate of INH metabolism and thus assists indirectly in maintenance of adequate blood level. Sodium PAS 100 mg. per lb. of body weight per day in divided doses is given orally.

Active tuberculosis nowadays is no contraindication for corticosteroids (prednisolone). They may be employed with advantage in the severely ill patient to secure more rapid alleviation of acute symptoms and toxaemia. They are also useful in cases of severe drug sensitivity in dosage of 1-2 mg. per kg. of body weight.

Viomycin is less effective than streptomycin or INH. It has sufficient antibiotic effect to cover surgery.

Pyrazinamide has high toxicity and may produce liver damage. Its antibacterial value is enhanced by concurrent use of INH.

Cycloserine has high toxicity and neurotoxic side effect, with convulsive episodes and frank psychosis. It is given orally in doses of 0·5 to 1·5 g. daily. It is unsuitable for prolonged treatment.

Rudanti and rudanti compounds are recently reported (in India) to have favourable results but their claims are yet to be established.

Chemotherapy properly employed can rapidly render infective sputum negative and cut short the period of hospitalisation and permit a more rapid and safer way to normal life and work, and thus avoid the complicated programme of rehabilitation and vocational training. Recent reports demonstrate that if the bacilli are drug sensitive and treatment is sufficiently prolonged it is possible to secure control over the disease in practically all cases and reduce the relapse rate to negligible proportions. Duration of treatment depends on special problems of each case but the consensus of opinion is towards longer treatment. Usefulness of bed rest in afebrile patients is being seriously questioned. Little activity seems to help the patient. Bactericidal action of the drug is much better when the bacilli are in active metabolic activity and are actively multiplying. Collapse therapy has become a matter of history. Lung resection is useful in cases of chemotherapic failure and resistance to standard drug. Hospitalisation is necessary for the toxic cases, cases with complications and infectious cases. Initial stay in hospital followed by home treatment would serve the purpose for individual cases. Rehabilitation may not be necessary in all the cases.

Tuberculosis is no longer considered a dreadful malady. It has come to be considered as an incident in one's life, often necessitating temporary interruption of his activities and plan. The patient may return to normal life, and need not have any tedious and unnecessary restrictions on his freedom.

INITIAL SYMPTOMS IN PULMONARY TUBERCULOSIS

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Cases of pulmonary tuberculosis presenting themselves to the clinician, usually complain of a multiplicity of symptoms. But at the onset of the disease they usually have only one or two symptoms. This statistical study shows the relative frequency of different initial symptoms, i.e., the symptoms which according to the patient, first appeared.

Material

The practice in this hospital is to note in the history sheet, the mode of onset of the disease, i.e., the symptom which the patient first observed. Records of these initial symptoms in 7456 patients admitted during the year 1931 and 1955 together with a group of 636 patients admitted to the hospital in the earlier part of 1960, making a total of 8092 cases, were studied. The initial symptoms in the order of frequency are shown in Table 1.

Table 1—Showing Percentage Incidence of Initial Symptoms in the Order of Frequency

Symptoms	Per cent		
Haemoptysis	28·7		
Fever and cough	24		
Fever (alone)	17·3	51·2	79·9
Cough (alone)	9·9		
Chest pain	7·5		
Lassitude	4·2		
Influenza			3·9
Abdominal trouble			2·3
Enlargement of lymph nodes	Less than 1		
Difficulty in breathing ...	,,		
Affection of bones and joints	,,		
Ischiorectal sinuses	,,		
Hoarseness of voice	,,		

Discussion

Haemoptysis—Under this head have been included all cases, complaining of coughing out only blood-tinged sputum of profuse haemoptysis. The incidence of haemoptysis occurring during the course of the disease, given by various authors range from 25 to 70 per cent. Bogen (1930) in Olive View sanatorium found it in 15 per cent cases, whereas Price (1926) mentions it in 50 per cent cases. In the present series incidence of haemoptysis as an initial symptom is 28·7 per cent, and comprise only just a little over one fourth of all cases.

Fever and cough—In Fishberg's (1932) opinion absence of fever excludes active disease and due to the evanescent rises it is often overlooked. He further states that as cough first attracts the attention of patients, this is produced as initial symptom. In the present series, cough alone as initial symptom, has been complained by 9·9 per cent of cases, and fever alone by 17·3 per cent. However, both fever and cough were noticed initially in 24 per cent. Thus fever and cough together and singly have been found in 51·2 per cent cases.

Chest pain—This includes all types of pain, from acute pain of pleurisy to vague dull pain over the chest. As initial complaint, this was present in 7·5 per cent of cases.

Lassitude—This, with or without loss of weight, accounts for only 4·2 per cent cases.

Abdominal trouble—This includes symptoms like anorexia, dyspepsia and diarrhoea. Taken together they form only 2·3 per cent.

Influenzal onset—Though small, it is a definite group comprising 3·9 per cent cases.

Other symptoms—Hoarseness of voice, enlargement of lymph nodes, affection of bones and joints, and ischiorectal fistula occurred as initial manifestations in very small percentage of cases, each group being less than 1 per cent. These manifestations of course were not symptoms of pulmonary involvement but they led the patient to seek medical advice and on investigation were found to have pulmonary tuberculosis along with affection of these extrapulmonary regions.

Summary and Conclusion

1. 7456 cases of pulmonary tuberculosis admitted in K. S. Ray Tuberculosis Hospital, Jadavpur, between 1931 and 1955 and 636 additional cases towards the end of 1960, making a total of 8092 cases were studied for initial symptoms, as they presented during the time of admission.

2. Haemoptysis ranging from slight streak to profuse bleeding was complained as initial symptoms in the highest number of cases (28·7 per cent). Fever and cough together were found in 24 per cent and singly in 17·3 per cent and 9·9 per cent cases respectively, and all together in 51·2 per cent cases of the present series.

ACKNOWLEDGMENT

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TUBERCULOSIS OF BONES AND JOINTS

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Tuberculosis of bones and joints is quite common in India and other underdeveloped countries and is due to poor economic condition, bad housing with overcrowding and undernutrition.

This is a secondary condition, the primary infection is always in the lungs or intestinal tract.

PATHOGENESIS

Tubercle bacilli settle in diaphyseal ends of bones to form the typical tuberculous avascular nodule, whose centre degenerates (necrosis) and periphery expands, replacing normal bony tissue to form the tuberculous granulation tissue. Surrounding areas become hyperaemic and oedematous and cause porosis and decalcification of bones. Further extension causes joint involvement. Thus osteoarticular infection occurs practically in all late cases. Only synovial affection may remain localised in children in knee joints.

Tuberculosis of bones and joints are of three types:

1. Osseous type—which may remain as such or extend into joint.
2. Osteoarticular type—involving both articular end of bone and joint.
3. Synovial type—involving synovial membrane of a joint.

Natural process of repair takes years unless hastened by antibiotics. Repair occurs by conversion of granulation tissue into fibrous tissue. Fibrosis thus encapsulates tubercle bacilli, but some of them remain active with a chance of flare up later on. Fibrous ankylosis of joint occurs which is liable to cause pain and recurrence of infection. Bony ankylosis does not occur here, unless secondary infection supervenes. The principle of treatment is to excise the focus and perform an arthrodesis of the joint for a permament and lasting cure.

CLINICAL FEATURES

Basing on this pathological process, the clinical feature may present in 3 stages:

1. *Acute stage*—When spread of infection and necrosis are predominant, pain, swelling, muscle spasm and limitation of movement (limp in inferior extremities) along with constitutional signs and symptoms, e.g., fever, anorexia, wasting and raised E.S.R. occurs. Unexplained limp in a child calls for a complete examination and observation for some time.
2. *Subacute or healing stage*—When reparative process more or less balances necrosis, pain and spasm are less conspicuous with subsidence of swelling and improvement in systemic condition. Deformity, wasting and sinus may develop.
3. *Healed stage*—Here reparative process is almost complete with fibrous ankylosis and improvement in bony texture. Deformity develops in untreated cases.

Radiological examination—In early cases, radiological findings may be absent, and a repeat examination after a few weeks may be necessary. The characteristic x-ray findings are:

1. General decalcification.
2. Increase and later on narrowing of joint space.
3. Destruction, i.e., erosion of bone ends.
4. Soft tissue shadow due to abscess formation. Late findings are gross disorganisation of joint, dislocation or collapse of bone.

DIAGNOSIS

Diagnosis is based on history especially of contact with a tuberculous case, clinical findings, spasm, limitation of movements, x-ray findings and biopsy of tissues or neighbouring lymph glands. Spasm of muscles is very marked in tuberculosis and is more or less a diagnostic sign.

TREATMENT AND MANAGEMENT

CONSERVATIVE TREATMENT:

The sheetanchor of treatment is rest—prolonged, uninterrupted and adequate, as an aid to natural repair. Antibiotics help the reparative process in tuberculosis.

In the acute stage general systemic treatment and rest by complete immobilisation in plaster or splint are advised with a view to knock off muscle spasm which produces deformity and articular damage.

In the healing stage partial immobilisation with braces and appliances may be allowed along with general treatment.

In the healed stage a patient is to be kept under observation. Gradually work may be allowed, with increased activity.

Each stage lasts about 2 years. With the advent of antibiotics, the time period has been cut short by more than 50 per cent, i.e. one year. Early surgical intervention shortens this period by further 50 per cent, i.e., 6 months.

Antituberculous drugs are streptomycin, PAS and INH. In use of these drugs, the following points should be noted: (1) Sensitivity tests before treatment is ideal and should be done for better effect. (2) No drug should be given alone. At least 2 of them should be given at a time to prevent or delay emergence of resistant strains and (3) Continuous treatment should be done as interruption produces resistance.

Problems in treatment are drug resistance, development of mutant strain, and assessment of the period of drug-treatment. The antituberculous drugs act by suppressing inflammation around lesion. Cellular reaction is intensified. They are generally ineffective against multiple lesions but favour encapsulation and prevent softening and liquefaction.

Streptomycin is the most effective in lung conditions but also effective in osteo-articular tuberculosis. Resistance develops if it is given alone. Streptomycin causes vestibular damage while dihydro-streptomycin causes auditory damage. Dose—1-2 g. daily or on alternate days depending on the severity of the case. Total dosage—90 g. for a single course.

The potassium salt of PAS is better than the sodium salt. It has bacteriostatic action by reducing oxygen intake and thus interfering with the metabolic process of bacteria. It implements the action of streptomycin and retards the appearance of resistant strain. Toxic symptoms are allergic manifestation, gastrointestinal upset, and euthyroid condition.

INH is a synthetic drug, which is as effective as streptomycin. It penetrates meninges and cell membrane to destroy bacilli. Toxic symptoms are mild, e.g., mental symptoms and peripheral neuritis. It should be avoided in epileptics. The above drugs may be locally instilled with success in tuberculous abscess and sinus.

SURGICAL TREATMENT:

As natural healing leads to fibrosis and fibrous ankylosis which is an unstable condition, permanent cure should be done by bony ankylosis or excision of focus. Before antibiotic days, surgery was done when infection was controlled, i.e., in healed or subacute stage and was limited to various types of extra-articular arthrodesis in joints, e.g., Albee in spine, Brintain's arthrodesis in shoulder and hip and excision or amputation in dispensable parts, such as ankle, toes and fingers. With antibiotic cover, it has now been possible to use surgery in all stages and even in acute condition and with sure and quick results. Excision of focus with removal of all pathological tissue is quickly followed by bony ankylosis as in the spine, hip, knee and shoulder (4-6 months). Excisional surgery as followed in the kidney or lung is also done in bone and joint affection instead of extra-articular arthrodesis which is a less effective method. In healed condition corrective operation, such as osteotomy and excision, is done.

CASE NOTES

SPINAL TUBERCULOUS MENINGITIS

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Transverse myelitis is a well-known though uncommon complication of tuberculous meningitis. It had received scant attention in the literature and the textbooks until Wilson (1940) and Brooks *et al* (1954) emphasised its importance. With the introduction of effective chemotherapy in the treatment of tuberculous meningitis this complication is by no means of academic interest only. Strangely enough, papers dealing with large series of patients of tuberculous meningitis (Choremis *et al*, 1948; Medical Research Council, 1948; Sommer, 1952; and Riley, 1953) have failed to emphasise spinal cord complications. Similarly reports dealing with the pathology of tuberculous meningitis (Schwarz, 1948; Winter, 1950) also do not mention the spinal cord lesions directly. In view of the serious implications of this complication and comparatively lesser attention being paid to it, it will not be out of place to report two personal cases—one of whom had a complete postmortem done.

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Case Reports

CASE 1 :

M. L., aged 30 years, male prisoner, was transferred from the Jail Hospital on 19-3-1939 with complaints of pain in the back and lower limbs and progressive weakness of both the legs for the last four months. He had moderate degree of fever during the last two months. Twenty days prior to his admission in our ward he had developed retention of urine needing frequent catheterisation. The notes sent by the doctor in-charge of the Jail Hospital showed that the patient had shown phases of temporary clouding of consciousness in the last three to four days. The whole ailment was of gradual onset and there was no previous history of any headache, vomiting or mental aberration.

On examination, the patient was found to be moderately built and nourished but looked toxic. The tongue was coated and moderately dry. Temperature 99·4°F. Pulse 80 per minute, regular and of good volume. B.P. 130/90 mm. Hg. Respiratory, cardiovascular and alimentary systems showed no abnormality. Examination of nervous system revealed normal higher functions. Speech and cranial nerves were normal. There were signs of upper motor neurone type of paralysis of both the lower limbs with extensor plantar response and absence of abdominal reflexes in all the four quadrants. There was evidence of defective sensations below the costal margin. Spine showed a vague and generalised tenderness below the level of sixth dorsal vertebra. Upper limbs showed no neurological deficit.

Investigations—Hb., 11·5 g./100 ml. Total leucocyte count, 5,800/c.mm. with a normal differential leucocyte count. E.S.R., 40 mm. 1st hour (Westergren).

Urine and stool showed no abnormality.

Serological test for syphilis was negative. Blood urea, 38 mg. per cent.

Fundus examination showed that the disc margins were blurred, disc was hyperaemic and showed oedema 1-2 dioptres only. Veins were fuller and small exudates were present round the discs. A patch of flame-shaped haemorrhage was noticed above the left disc.

C.S.F. examination (25-3-1959) showed xanthochromic fluid, Queckenstedt's test was negative, a big clot formed in the test tube and chemical analysis showed protein 2·4 g. per cent, globulin 15+, sugar 16 mg. per cent and chlorides 585 mg. per cent. One to two lymphocytes per field were seen. C.S.F. examination repeated on 1-4-1959 showed similar findings.

Skiagram of the skull, dorsolumbar and lumbosacral spine and chest revealed no abnormality.

Treatment and progress—Patient was put on streptomycin 1 g. intramuscularly and isoniazid tablets 300 mg. daily. While still under treatment patient became markedly delirious on 30-3-1959 and required repeated injections of paraldehyde. He further worsened and on 3-4-1959 he became semi-conscious. Prednisolone 20 mg. daily was started at this stage, but he became markedly drowsy and developed bilateral signs of aspiration pneumonia which were confirmed by a bedside skiagram of the chest. His condition progressively went downhill and he died on 7-4-1959.

Autopsy findings—Macroscopic : Respiratory system—Right lung : weight 1160 g., pleura thickened, cut surface showed patchy pneumonic consolidation. Left lung : weight 1200 g., pleura thickened, cut surface showed patchy pneumonic consolidation and oedema. Bronchial lymph glands were enlarged. In the lower lobe, small areas of infarction were seen.

Circulatory system—Heart : weight 290 g., left ventricular wall slightly thinned out, left ventricle slightly dilated, other chambers normal in dimensions. Valves were normal.

Alimentary system—G.I. tract was normal. Liver, pancreas and gall-bladder showed no abnormality. Tubercles were present on the surface of the spleen. Kidney showed no abnormality. Urinary bladder was distended with turbid urine and its wall was thickened. Adrenals were normal.

Brain—Weight 1400 g. ; no abnormality was detected on naked eye examination. Spinal cord—In the dorsal region (6th and 7th vertebrae) the duramater was slightly thickened and adherent to the vertebrae.

Microscopic : Lungs showed patchy hepatisation, oedema and infarction. Pulmonary vessels were full of blood clots. Left bronchial lymph glands showed tuberculosis. Slight atrophy of the myocardium was seen. Chronic miliary tuberculosis and mild fatty changes were seen in the liver. Small intestine and pancreas showed no abnormality. Spleen showed chronic miliary tuberculosis. Kidneys were slightly congested and adrenals were normal. Urinary bladder showed chronic cystitis. Slight postmortem autolysis was detected in the brain. After repeated sections it showed some tubercles in the meninges and a few adhesions in the basal region. Spinal cord showed frank evidence of meningitis with degeneration of spinal cord.

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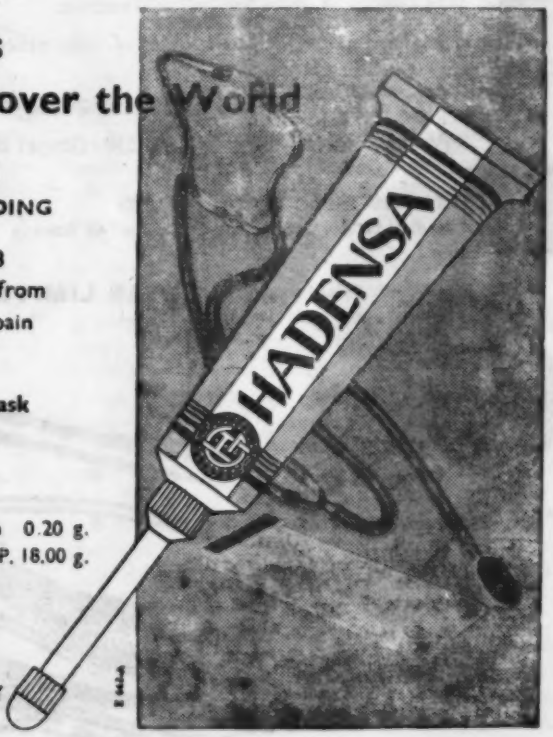

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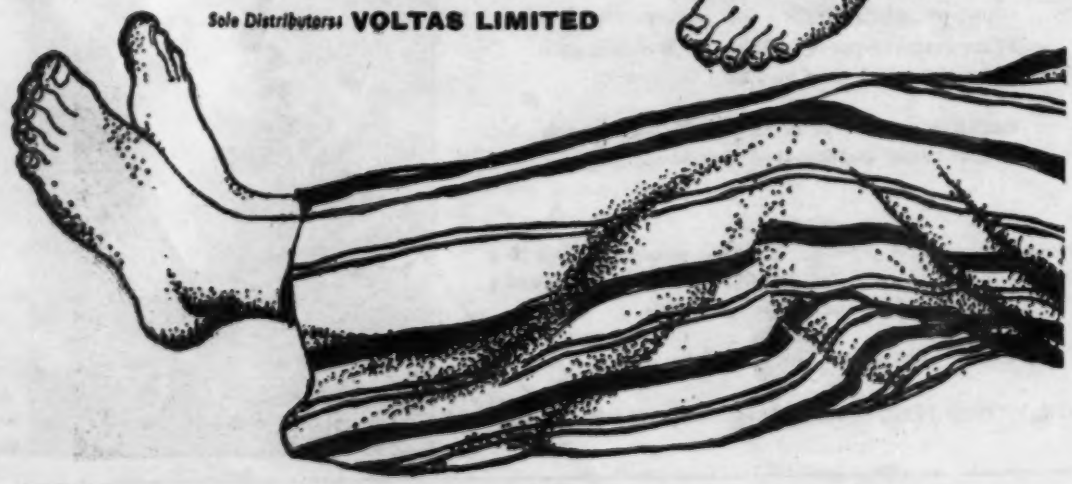

Comments—This patient was admitted with progressive spastic paraplegia of insidious onset. There was no evidence of caries spine. At the time of admission there was evident paraplegia and the C.S.F. findings suggested spinal block tuberculous meningitis though the higher functions were intact. There was evidence of raised intracranial pressure but the paraplegia had a spinal level and did not seem to be due to cortical damage. Later the patient became unconscious and delirious and showed clinical evidence of cerebral meningitis. Autopsy showed chronic miliary tuberculosis involving the spleen and liver with evidence of tuberculous lesion in the left bronchial lymph node. Minimal cerebral and frank spinal tuberculous meningitis causing compression degeneration of the spinal cord at D6 was also evident.

CASE 2:

G.S. aged 31 years, male was admitted three times in our ward, the first one being on 6-1-1959. At the time of his first admission he complained of vomiting, insomnia and loss of weight of one month's duration. Three months prior to that he had an attack of fever with the temperature range of 100-101°F. which continued for 25 days.

General physical examination and systemic check up showed no abnormality.

Investigations—Hb. 9·5 g./100 ml. E.S.R. 15 mm. 1st hour (Westergren). Total and differential leucocyte counts, urine and stool examinations, and fractional test meal analysis showed no abnormality. Straight x-ray of the abdomen and barium meal study of gastroduodenum were noncontributory. Skiagram of the chest showed findings of miliary tuberculosis. C.S.F. was clear and a few R.B.C. and lymphocytes were seen under the microscope. Biochemical examination of C.S.F. showed proteins 650 mg. per cent, globulin 4+, sugar 62 mg. per cent, chloride 643 mg. per cent.

Treatment and progress—The patient was put on antituberculous regime and showed symptomatic relief within one week and was discharged.

He was re-admitted on 28-4-1959 with loss of appetite and gradually progressive weakness of both lower limbs of 1½ months' duration. He had sustained no spinal injury. He was fully conscious and had no headache, vomiting or visual disturbances. Cranial nerves, higher functions and upper limbs revealed no abnormality. Lower limbs showed bilateral foot drop, muscular weakness, hypotonia and feeble tendon jerks. Planters were bilaterally indeterminate. No sensory loss or hyperalgesia was present. Other systems were normal.

Laboratory data was normal except C.S.F. which was clear and colourless, and showed occasional leucocytes. Protein was 430 mg. per cent, globulin +++, chloride 643 mg. per cent and sugar 54 mg. per cent. X-ray of the lumbosacral spine was normal.

The exact cause of this neurological lesion was missed at this time and he was thought to have either acute infective polyneuritis or toxic neuritis. He was discharged on 22-5-1959 with slight improvement. Anti-tubercular treatment was continued.

On 15-9-1959 he was admitted for the third time with persistent weakness of the legs. He had developed headache and vomiting for the last fortnight. Occasionally he was stuporous and delirious. He was often mentally clouded and was not cooperative. He was at times violent and paraldehyde injection was needed to control his delirium.

Physical examination showed that the findings in the lower limbs were essentially similar to his last admission. There was no papilloedema or any other cranial nerve involvement. There was slight rigidity of neck. Mental apathy and delirium often alternated. C.S.F. showed clear fluid with increased pressure and occasional lymphocyte per field. Protein was 650 mg. per cent, globulin ++++, sugar 54 mg. per cent and chloride 620 per cent. Lange's gold colloidal curve was flat.

He was thought to have developed signs of meningoencephalitis besides spinal compression which was persisting since his last admission. In view of chronic miliary tuberculosis in the lungs this meningitic process was also attributed to tuberculosis and treated with streptomycin, isoniazide and prednisolone. He improved considerably within 10 days and gradual but definite improvement was noted during the follow up period of 4 months. He was discharged and advised to continue isoniazide and streptomycin. He was last seen on 12-10-1960 and walked on a broader base with a high stepping gait. Minor degree of muscular wasting and weakness was seen in leg muscles, left being weaker than right. The knee and ankle jerks were brisk and ankle clonus was present on the left side. Plantar response was extensor on the left side and indeterminate on the right. No sensory loss was noted. His higher cerebral functions were fairly normal.

Comments—This case with chronic miliary tuberculosis of the lungs presented a clinical picture of spinal section of rapid onset initially and was diagnosed correctly only when frank meningitis developed. Spinal lesion preceded the cerebral

involvement by 4 months. Though no definite proof is offered, there are strong grounds in view of the chronic miliary shadows in the lungs, raised total protein, globulin and cells in the C.S.F., and therapeutic response, that he had initially spinal tubercular meningitis which later extended to the intracranial cavity.

Discussion

Both these patients presented with spinal cord lesions and cerebral features were seen much later. It is distinctly an unusual mode of presentation and should not be compared with a relatively frequent complication of spinal cord compression or vascular damage secondary to and during the later phases of treated or otherwise survivors from cerebral tuberculous meningitis. The latter form of complications though not sufficiently emphasised are well recognised. It is known that in certain cases portions of spinal cord taken on post-mortem may look normal on naked eye examination but microscopically show evidence of tubercular pathology (Brooks *et al, loc. cit.*). Our first patient showed very minimal evidence of disease on naked eye examination and the clinical diagnosis was seriously doubted by the pathologist till histopathological reports were available.

Though the vascular complications with resultant hemiplegia and aphasia are not infrequent in cerebral tuberculous meningitis, similar features in the spinal cord are fairly uncommon. This is probably due to the nature of vascular supply to the cord. The free anastomosis between the vessels of the adjacent spinal segments prevents massive destruction unless a large number of vessels extending over a part of the spinal cord are obstructed simultaneously. Obliterative changes in the spinal cord vessels are not unusual at autopsy but cord destruction and damage is relatively rare.

Besides the relatively acute onset that may be associated with the vascular damage there can be a gradual onset of spinal paraplegia. Fibrous adhesions between the dura and arachnoid may press on the cord as an obstructing band and produce picture of spinal cord compression. Evidently vascular lesions are not essential for the development of spinal paraplegia though they are often associated with dura-arachnoid adhesions. Such fibrous adhesions can easily compress and impede the blood flow in the vessels even if there is no true arteritis and aggravate the clinical picture.

It is well recognised that the clinical picture in some of these patients may resemble cauda-equina lesions but the sparing of bladder and rectum is a strong point against such a possibility (Brooks *et al, loc. cit.*). Our second case is an example of this type of lesion.

Though there has been a great advance in the treatment of tuberculous meningitis due to effective chemotherapy the incidence of unusual complications is tending to increase. The variable clinical picture that can be presented by the treated or partially controlled cases of tuberculous meningitis can be confusing and present a diagnostic riddle. However, most of these complications are due to plastic exudate organising to form thick adhesions and associated perivasculitis and arteritis. If the development of adhesions could be prevented by using agents that actively disperse the fibrin exudate some of these complications may be avoided. Corticoids seem to hold some such hope for the future.

Summary

1. Two cases of transverse myelitis as a complication of spinal tuberculous meningitis are presented.

2. Pathogenesis and diagnostic features of the complication along with its preventive treatment are discussed.

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PANCOAST TUMOUR

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A male patient named Chappo, aged 60 years, with a clinical diagnosis of pulmonary tuberculosis, was sent to the radiology department in November, 1960, for skiagram of the chest. The skiagram revealed a homogeneous opacity occupying the left apex and subclavicular area with destruction of the posterior part of the second rib.

These findings aroused a suspicion as to the possibility of it being the case one of Pancoast tumour.

The chief complaints were cough with slight expectoration (6 months) ; pain in the left subclavicular area which was more marked posteriorly in the scapular area (5 months) ; and loss of appetite, loss of weight and marked weakness (4 months).

The pain used to radiate along the inner side of the left arm and was sometimes so marked that the patient could not sleep at night.

The patient was a mill worker and was a smoker for the last thirty years. There was no family history of tuberculosis or cancer.

On examination the patient was found to be emaciated. Pulse was 100 per minute, B.P. 100/70 mm. Hg (in both arms) and pupils were equal and reacting to light. One lymph gland, hard in consistency and mobile, wals palpable in the left infraclavicular area. Wasting of the muscles of the left shoulder girdle and also of small muscles of the left hand, was present (Fig. 1, *vide* Plate). Diminution of motor power and sluggish reflexes in the left upper limb were detected.

On examination of the respiratory system, there was dullness over the left apex and subclavicular area with marked tenderness on percussion over the second rib. On auscultation there was found only diminished breath sounds in the left apex and left subclavicular area. Other systems were clinically normal.

INVESTIGATIONS :

1. *Skiagram chest*—This showed a homogeneous opacity in left apex and subclavicular area with destruction of the posterior part of the 2nd rib (Fig. 2, *vide* Plate). The destruction of the rib was seen even more clearly in skiagram taken especially for upper ribs.

2. *Tomography*—Tomography also showed a well defined opacity in the left apex and subclavicular area (Fig. 3, *vide* Plate).

3. *Fluoroscopic examination*—There was no restriction of diaphragmatic movements on either side.

4. *Blood examination*—It revealed Hb. 84 per cent, total W.B.C. 8,100/c.mm. with polymorphs 74 per cent, lymphocytes 24 per cent, eosinophil 1 per cent, and monocyte 1 per cent. E.S.R. 22 mm. per hour (Wintrobe). Blood W.R. was negative.

5. *Sputum examination*—It was negative for A.F.B. both by ordinary and concentration methods and on repeated examination. Sputum culture for A.F.B. done on Löwenstein-Jensen medium remained sterile even after six weeks. Examination of sputum for malignant cells was negative.

6. *Urine examination*—Sugar and albumin were absent.

FOLLOW-UP OF THE CASE :

The general health of the patient had already gone down much when the diagnosis of Pancoast tumour was first made by us. Since then the condition of the patient went down hill very rapidly and he died in the first week of January 1961, i.e. within eight months of the onset of symptoms.

Autopsy could not be performed. Biopsy of an enlarged lymph gland in the left infraclavicular area was performed.

Biopsy report—The structure of the lymph gland was almost completely replaced by metastatic deposits of squamous cell carcinoma. The cells were hyperchromatic and showed loss of polarity and a fair number of mitotic figures. At places there was formation of cell-nests. There were areas of excess of keratin formation and degeneration.

Diagnosis—Metastatic squamous cell carcinoma.

COMMENTS

This condition was first described by Pancoast, in 1924 and later on called by him superior pulmonary sulcus tumour. The condition produces a definite clinical syndrome to deserve mention.

The anatomic location of the lesion within the confines of the thoracic inlet determines its clinical features, which are the result of compression and invasion of the brachial plexus, sympathetic chain and the surrounding ribs. Pain, atrophy in the area supplied by the brachial plexus, and opacity in the pulmonary apex with destruction of adjacent ribs and Horner's syndrome on the same side are the salient features of Pancoast syndrome.

Recent literature shows that depending upon the size, stage of development and invasive qualities of the lesion, the syndrome may be incomplete or additional features may appear as further neighbouring structures are involved by the tumour. The importance of the condition lies in its rarity and difference of opinions regarding its aetiology and treatment policy. Initially, Pancoast thought it to be a bronchogenic epithelioma but later on this theory was discarded as further observations showed that a wide variety of tumours, malignant as well as non-malignant may produce a Pancoast syndrome. However, the majority of these cases have been found to be produced by a bronchogenic carcinoma arising in the extreme pulmonary apex.

ACKNOWLEDGMENT

We are very thankful to Dr. V. D. Singh, Lecturer in Medicine, and Dr. B. S. Darbari, Lecturer in Pathology, for their kind help in investigating the case.

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NON-RESPIRATORY TUBERCULOSIS

The exact incidence of non-respiratory tuberculosis is difficult to determine because in most records of non-respiratory tuberculosis no account is taken of cases of respiratory tuberculosis with one or more tuberculous lesions outside the respiratory organs. In England and Wales it is estimated that rather less than a seventh of all notified cases of tuberculosis are non-respiratory[1]. Although this proportion is not necessarily applicable to our country, it is obvious that a very large number of cases of non-respiratory tuberculosis would be seen.

The usual route of tuberculous infection in human beings is through the respiratory and alimentary tracts. Thus the lungs, intestines and oropharynx are the most common sites of primary infection and hilar, mesenteric and cervical glands are affected as a part of primary complex. In reinfection also the respiratory tract is the usual route of infection. Tuberculous lesions outside the respiratory or alimentary tracts and their corresponding lymphatic glands must therefore arise as a result of spread of infection from these sites by the blood stream or lymphatics. After the primary infection the body acquires hypersensitivity and specific resistance to *M. tuberculosis,* and such spread becomes very difficult. There is evidence, however, that considerable bacillaemia occurs after the primary infection before hypersensitivity and immunity develop. Bacilli may reach the blood stream in varying numbers either through the lymphatics and thoracic duct, or by direct erosion of caseous foci into neighbouring blood vessels, or by development of tubercles in the walls of the blood vessels in the primary lesions. This early bacillaemia is believed to be largely responsible for the non-respiratory tuberculous lesions developing into progressive metastic foci in bones, joints, meninges, kidneys or other sites. Acute haematogenous spread producing acute miliary tuberculosis may also occur in progressive primary tuberculosis in patients with very poor resistance or in the terminal stage of chronic progressive tuberculosis when the patients' resistance breaks down and a large number of bacilli enter the blood stream.

Metastatic non-respiratory tuberculosis therefore develops usually soon after the primary infection and is most likely to be seen in children and adolescents. Bacilli deposited at distant sites in the body due to postprimary dissemination may however remain dormant for a long time and become active again when conditions favourable to their growth occur as a result of lowering of host's local or general resistance due to various factors.

Although tuberculous infection is very widespread as shown by high tuberculin sensitivity rate, the primary infection passes off without any clinical signs or symptoms in the majority of the infected persons. Only a minority develops clinical or radiological manifestations of tuberculosis or dies of tuberculosis. The proportion of infected persons who develops clinical symptoms of primary infection or its subsequent local or haematogenous spread depends on a number of factors, such as, age of first infection, degree of exposure and the infecting dose, racial and hereditary susceptibility, condition of health and nutrition at the time of infection or subsequent debilitating influences, etc. It is very difficult to determine this proportion or the risk of developing tuberculous disease, respiratory or non-respiratory, after exposure to infection, in a given population unless a large number of children or tuberculin negative persons are kept under long observation in their natural environments from the date of their tuberculin conversion. A few such studies have been reported. Nissen Meyer (quoted by Bentley

[1] HEAF, F. R. G.—Symposium of Tuberculosis, 1957, Cassell & Co., London.

et al[2]) reported in 1949 that extrathoracic tuberculosis occurred in 5 to 10 per cent of children infected before the age of 3 years and in about 2 per cent of older children. Chronic pulmonary tuberculosis developed in 2 to 3 per cent in those infected in childhood and in 10 per cent in those infected after the age of 13 years. Holmdahl (quoted by Bentley *et al*[2]) followed 657 cases of primary tuberculosis with erythema nodosum for an average of 15·4 years and found that the risk of haematogenous complications was 6·2 per cent and this mostly occurred in the early period following primary infection. Cammock and Miller (1953)[3] estimated that 4·1 per cent of all infected children below 5 years ran the risk of developing miliary and meningeal tuberculosis and 1·5 per cent, of skeletal tuberculosis. It may therefore be presumed that in this country with a very high infection rate, and with most of the factors favouring development of clinical tuberculosis and haematogenous spread, a much higher proportion of the infected children would develop haematogenous complications of primary infection.

The symposium on 'extra-pulmonary tuberculosis' held under the joint auspices of Nagpur branch of the Indian Medical Association and Lederle Laboratories (India) Private Ltd. has done well in drawing attention to this problem. Some of the papers read at the symposium are published in this issue. This problem can only be tackled by the overall control of tuberculosis in this country. Measures which may immediately reduce the chances of tuberculous bacillaemia producing metastatic foci or general haematogenous spread or chronic progressive tuberculosis from a primary infection are: (1) prevention of heavy infection early in childhood by prompt diagnosis and chemotherapy of infective cases in the family, (2) prophylactic chemotherapy of exposed children, (3) B.C.G. vaccination. Raising the standard of living and improving nutritional and environmental conditions are long-term measures.

Study of tuberculosis in children born and living in families settled at after-care centres such as Papworth and Preston Hall village settlements in England has amply demonstrated that natural tuberculous infection in childhood under good environmental conditions does not carry any sinister implication. Over a period of 25 years although 78 to 80 per cent of younger inhabitants gave positive reaction to tuberculin and nearly 49 per cent of children showed radiological evidence of primary infection, none of the children born in the settlements showed any sign of clinical tuberculosis and there was no case of tuberculous meningitis[4].

P. K. CHATTERJEE

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XXXVII ALL-INDIA MEDICAL CONFERENCE, KANPUR :: JAN. 4—6, 1962

At a meeting of the Reception Committee of the 37th All India Medical Conference, held on 25-9-1961 at 4 P.M. in the "Temple of Service", under the Presidentship of Dr. C. Rohatgi, the following office-bearers have been elected:

Chairman Reception Committee—Dr. S. P. Srivastava.

Working Chairman—Dr. C. Rohatgi.

Vice-Chairmen—Dr. B. L. Rohatgi, Major Bishan Singh, Dr. C. P. Gupta, Dr. K. N. Gour, Dr. M. M. S. Siddhu (Lucknow), Dr. R. N. Gupta (Lucknow) and Dr. Mrs. Chotey Lal (Farrukhabad).

Organising Secretaries—Dr. R. K. Jalota and Dr. Navin Chandra.

Treasurer—Dr. S. N. Saxena.

CURRENT TOPIC

THE GENERAL BACKGROUND OF THE EDUCATION AND TRAINING OF THE GENERAL PRACTITIONER*

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Momentous changes have taken place in the political and economic set up of India since our attainment of independence. The Prime Minister has summed up for us these changes and their implications. "These years since independence have been vital years for us, the change over from foreign rule to self-rule, the adaptation of the old order to the new order, the many new problems that faced us and the approach to these problems from the point of view of the interest of the masses, the growth of planning and our Five Year Plans, the special attention to industry and agriculture, the question of unemployment, and the basic question of our fight against poverty and of changing a static and stagnant economy and making it dynamic and self-reliant. In this great and many sided struggle, the question of the health of the nation has been necessarily of importance".

Even before the attainment of our independence, the then Government of India was conscious of the urgent necessity for the revision of the then existing medical service so that its benefits may be made available to the entire population of India. For this purpose they appointed the Health Survey and Development Committee in 1943, to make an inclusive survey of the many complex factors involved and advise them as to the steps to be taken to achieve this end. The H.S.D.C.'s report displays a breadth of view and an intensity in its enquiry that renders it the most outstanding contribution on the subject so far attempted. Since the publication of this report in 1946, we have attained our independence and have set up, for the first time in our long history, a democratic regime with its economy geared to the concept of a welfare state. Still the recommendations of the H.S.D.C. hold good, as it had taken into consideration a socialistic pattern of medicine and based its recommendations from that point of view and so can form the basis of any present or future health programmes.

During the past half a century phenomenal progress has taken place in the field of medicine also. The discoveries of Pasteur, Lister, Koch, Erhlich, Domagk, Fleming and Hopkins, have not only disclosed to us the causes of most of the devastating diseases and the methods of their prevention and control but have also contributed newer knowledge with regards nutrition, health and its maintenance. These contributions have profoundly altered our conception of medicine and have shifted the emphasis from disease and its cure, to health and its attainment and preservation.

From this new point of view, it should not be difficult to define our requirements with regard to an ideal medical service. They may be briefly stated as follows: 1. We must help the fit to remain fit by "keeping the ring" for them and by preserving the amenities. We must also help the near-to-fit to be quite fit. This does not require artificial means because it is a natural thing and nature tends that way if she is given a chance. 2. We must raise the general standard of fitness, i.e., health, by correcting certain tendencies towards lowering it, inherent in modern life. At present the life of many clerks, miners, school children, etc., impedes natural functions. More important still, we must provide enough of proper food for those millions of our fellows who do not at present get it. 3. We must do our utmost to control disease due to preventable agents. This means research and an army of well-trained medical officers of health to implement the knowledge we have and is yearly increasing. 4. We must cure or alleviate disease when it occurs. This means an army of well-qualified medical men for attendance upon the family in its home and well equipped hospitals for institutional treatment.

These are our requirements and they should be considered in that order, more and more in that order, as civilisation progresses and as the greater infections come under control. In any medical service in a welfare state there are three integral parts of the machinery, viz., the State, the citizen and the medical man.

The Prime Minister in the following statement has given us his appreciation of the problems involved in the establishment of a medical service for a welfare state and the steps taken by the union Government towards its realisation:

"The pursuit of health or the raising the health of the nation does not mean merely the curing of diseases but more so the prevention of it. Thus while hospitals and the like are necessary, what counts is the public health approach, as well as, health education. Health to-day does not consist merely in the avoidance of bodily ailment but comprises in its scope the health of the mind which has a direct effect on the body just as bodily ill-health often affects the mind.

"The first consideration in raising the health of the nation is to supply adequate food, properly balanced. Poverty and ill-health do not go together. A war on disease and ill-health is, therefore, essentially a war on poverty and all its evil brood. In effect it is the raising of the standards of the nation in every way and we come back to our Five Year Plans whose aim it is to do this.

"While our cities and towns require to be looked after much better than they are at present, it is really the village that has been terribly neglected and cries loudly for succour. Public health must, therefore, go to the villages and the village should not be compelled to come to the town in search of it. Our Community Development Movement will, I am sure, play a very important part in this extension of public health services to our rural areas.

"I have no doubt that we should also aim at a National Health Service which would supply free treat-

* Dr. P. Kutumbia Endowment Lecture I of Andhra University.

ment and advice to all those who require it. But, that is still a distant prospect, though we should keep it in view and endeavour to approach that objective."

All the items of a medical service for a welfare state have been thought of and steps, towards its realisation, set in motion.

The citizen, has not only a natural craving for a healthy life of the body, he has also a craving to find out what is valid in the life of the spirit. But before he is alive to any of these things he has certain basic needs which must be satisfied before he can be called healthy or happy. He must have enough of the right food, decent shelter, a job of work under suitable conditions, opportunity for play and access to sun-shine and fresh air. These are simple things but things without which, health and happiness, are but a mirage and yet it is found difficult to provide them for millions of our people. Even the most devoted, diligent and single-minded minister of health cannot of himself bring this mirage to earth; to succeed he must have the active co-operation of the citizen in his efforts. The idea must be inculcated that ultimately, the health of the individual is his own responsibility and the most effective way of achieving this object would seem to be to stimulate his health consciousness by providing health education on the widest possible basis, as well as, opportunities for his active participation in local health programmes. The citizen is now conscious of his rights and demands it of the State. The State should demand of the citizen that he should be conscious of his duties to the State and performs them.

The most important person in the whole set-up is the doctor "the medical man" who makes the contact with the citizen and "gets the thing across". The doctor is not only the indispensible link between the citizen and the health services, he is himself the most important part of any medical service. We are primarily concerned with him, his education and training, his duties and responsibilities.

The recent advances in medicine have profoundly altered our conception of medicine and have given a new orientation to our ideas of its functions. Medicine is no longer an art concerned with diseases, its cure or alleviation but has been transformed into a science dealing with health and its maintenance. This conception is not a new discovery. It has been held and taught by Charaka, the famous Indian physician as early as the second century A.D. Ayurveda was the name given to the science of medicine by ancient Indians. "The sole aim of Ayurveda" writes Charaka "is to advise diet, medicines and a regimen of life, such that, if they are properly followed a normally healthy person may maintain the balance of his dhatus (bodily constituents) and a person who has lost the equilibrium of his dhatus (bodily constituents) may regain it". Thus the aim of Ayurveda is declared to be health and its preservation. This concept has been lost sight of in India in the legion of diseases that seemed to have plagued her in the succeeding ages, which diverted attention to the immediate pressing problem of dealing with these diseases as they manifested themselves. What was a pious hope with Charaka has become a possible reality by the discoveries of modern medical science and it remains for us to translate this hope into reality by the help of modern medicine in our welfare state.

The Government is fully conscious of its responsibilities to the citizen and is tackling the problem of food, housing and raising the standards of living by initiating and successfully carrying out its Five Year Plans. Simultaneously with the above, the problem of supply of medical men in the required number and of the right quality should be tackled. The utter inadequacy of the available number of medical men, for the task to be accomplished, is painfully realised. It is with regard to the methods to be adopted to raise the required number of medical men that great deal of discussion and diversity of opinion are noticeable. It should be evident that this task is the concern of the experts in medical science and not of the lay-man or even the politician. This fact is not sufficiently realised and all sorts of solutions are offered by well-meaning but not well-qualified men to solve this problem. The very urgency of the present need seems to engender ill-conceived and hasty solutions. One solution, which has been offered and advocated, is the obvious one of shortening the present period of medical studies to three years, creating more medical colleges and increasing the number of admissions to the existing medical colleges in order to mass produce medical men. This last suggestion has been urged with great insistency by the Indian Medical Council. Such solutions are of limited value and in the long run may even prove disastrous. Thus if the present number of medical men is to be greatly and urgently increased within the next few years, many new medical colleges must be created to train them but it is apparent that qualified teaching staff are not at present available, even to man adequately the existing colleges. If such a scheme is hustled through, perforce, the teachers insufficiently prepared for the task will provide inferior teaching and training and turn loose upon the public poorly qualified medical men. Similarly, immediate demands for a greatly increased volume of medical service, would throw an insupportable burden on the medical profession and increase, primarily, the practice of mediocre medical men, who had secured little patronage under competitive conditions.

This problem has, unfortunately, been treated as a mathematical problem involving quantities and solutions offered on that basis. But, it must be realised, that the problem is a biological one dealing, not with quantities, but with qualities and calls for different methods of solution.

We have mentioned already that the implementation of the needs of a medical service for a welfare state requires an army of well-trained and well qualified medical men and research workers. We have discussed the problem of numbers and it remains to discuss the quality of medical men needed. The quality of the entrants into our medical colleges will determine the quality of the medical men turned out of these colleges. C. D. Deshmukh, the ex-chairman of the University Grants Commission, has rendered a valuable service to

the cause of medical education by drawing the attention of the educationalists to the unsatisfactory state of the quality of the entrants to our colleges. The medical educationalist is very much concerned with the training offered to the entrants at different levels. The education of the medical man begins in effect with the high school experience. The recent reforms introduced in our pre-collegiate and collegiate education have brought about a state of affairs that has proved unsatisfactory as far as professional education is concerned. Formerly the high school was an institution, whose primary, if not exclusive, purpose was to prepare the student for the arts as well as professional colleges. Now, the high school education is rightly considered as an end in itself, rounding off the necessary education of most students for a start in life. The abolition of the intermediate course, which was intended to be a preparation for entrants for degree courses, has created a void which has not been satisfactorily filled. Any student, who has successfully completed the high school course and obtained the necessary grades in the examination, is eligible for admission into a professional college. It is found that this preparation is inadequate for the needs of the pre-clinical course. The rapid expansion of the high schools has tended to lower the standards of instruction to a mediocre level, both because of the masses of students involved and because of the difficulty of finding suitable teachers in adequate numbers. The vernacularisation of the teaching in the high schools has proved a further handicap to students entering professional colleges where the teaching is imparted in English and is likely to be so for many more years to come. With the abolition of the intermediate course the best training ground for entrance into the professional colleges has been removed. The present solution of a pre-registration course in its stead is not only unsatisfactory but is quite inadequate. The four years university course has been reduced to three years in the re-organisation. This three year course should have formed the substitute for the abolished intermediate course for very valid reasons. First, the student can now enter a medical college at the age of sixteen years. It is held that a certain maturity is demanded of a medical student and this maturity is more likely to be attained, according to the opinion of competent educationists, at the age of twenty-one than at sixteen. Secondly, it is pointed out that the medical man in a welfare state should possess humane as well as technical interests and have some understanding of the economic and social order in which he has to operate. Thirdly, a considerable knowledge of mathematics, natural and social sciences, is absolutely essential for a medical student if he has to take full advantage of the highly scientific teaching offered in medical colleges. If a knowledge of all the above subjects has to be acquired, the only possible time for its acquisition is during a collegiate course prior to entrance into medical college. Lastly, the medical student must be brought up in an university atmosphere if he has to play his part intelligently in a medical college. This atmosphere can only be provided for in arts colleges and not in a medical college. If sciences and humanities have to be taught it can only be done in the three years collegiate course now instituted in the place of the two years intermediate course. Moreover there are immense difficulties in finding room for basic physics and chemistry and biology in an already crowded medical curriculum. For the future progress of scientific medicine in India it is imperative that every student before admission to a medical college should take a university degree in general sciences. If such a change could be brought about there is no reason why it should not be, the type of students entering our medical colleges would be far superior to the present entrants and this would be reflected immediately in the quality of the graduates turned out. This insistence would mean that the period of study before entry will be increased but it should be possible to reduce the duration of the medical course proper in order to balance such an increase.

The quality of the education and training given to these entrants demands careful consideration. Medical science consists mainly of two activities, viz., the activity which administers to the immediate needs of the sick individuals which may be termed "Curative medicine" and the activity, the immediate object of which is to advance knowledge which may be termed "progressive medicine". Every medical college must be organised so as to give training in both these activities.

"One of the main lessons of medical history has been that, in neglect of research into truths below the surface, medicine, for lack of deeper anchorage, has always sunk back into empiricism and routine. Thus the period of Ionian scientific insight, with its Hippocratean medicine and surgery, waned until the new birth of science and medicine in Alexandria. Then, as research languished, the drift was downwards again to rule of thumb and recipe therapeutics; though once more by the physiological researches of Galen it was transiently lifted up until the obscuration of all sciences in the long Byzantine and mediaeval eclipse. The skill and sagacity and aphorisms of Hippocrates and Sydenham, did useful work for mankind in the twilight. But to-day physiological and pathological science is running too fast for the medicine of individual and empirical authority, medicine which may be described as upto date but not beyond it; the medicine of the day not of the morrow; the studentship of the diploma but not of the university. The advance and accomplishments of the ancilliary sciences are becoming too swift and too exacting both of time and training, for the clinical worker to keep pace with them or from them select fertile principles for application to his immediate work".

We should pay particular heed to this lesson of medical history and not make the mistake of turning our medical colleges into tutorial colleges for turning out of medical practitioners but should turn them into sanctuaries where "progressive medicine" may dwell and flourish. Our medical colleges are at present so organised that the greatest emphasis is laid on "curative medicine". Our graduates are trained to diagnose diseases with all the latest mechanical appliances and techniques and treat them according to the best traditions of modern medicine. He is trained to become competent to manage sick people. Our postgraduate

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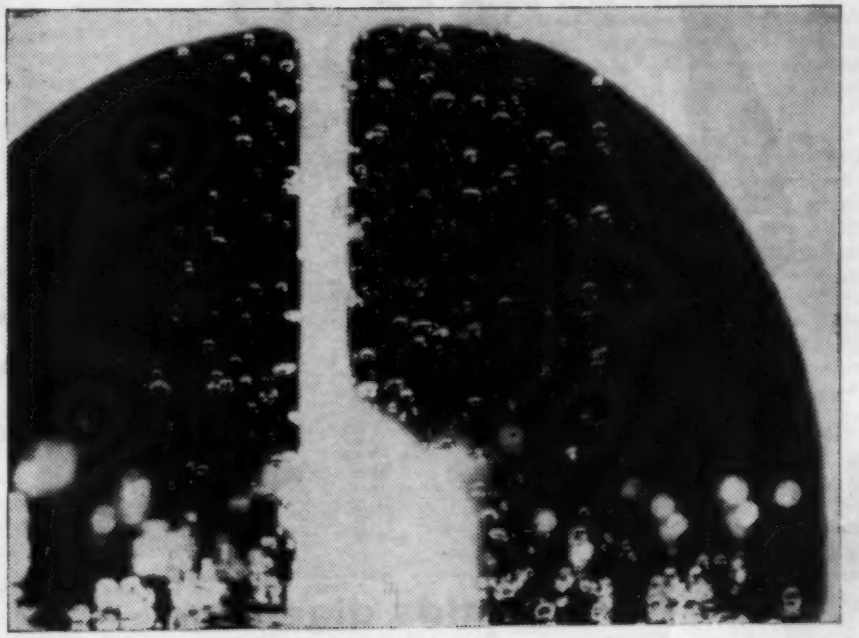

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training aims at training them adequately to become reliable consultants. Our present system of training is very suitable as a preparation for "curative medicine". It is admirably suited for the purpose for which it has been deviced. but this system and the atmosphere surrounding it is ill-suited to the advancement of medicine by research, i.e., "progressive medicine".

"Fascinated as they are, by the practical wisdom, sagacity, ripe experience and clever resources of their medical and surgical teachers the pupil loses vision of medicine as a science. He returns to us for the examination an excellent apprentice, but no longer of the company of prophets. For a diploma, the doctoring of the day, he is good; from an academic stand point, from an outlook to the medicine of the morrow, from a vision of the continual carrying and weaving of the yarn of biochemistry and biology into the web of his art, he has fallen away. For him the future lies undisturbed and unquestioned; the spirit of curious investigation has evaporated. Harley Street is the grave, shall I not say the cemetry?—of clinical research".

The organization of "progressive medicine" has not received the same attention as that of "curative medicine" in our colleges. "Curative medicine" draws its vitality from "progressive medicines". So in every adequate medical college there must be a professoriate of whole time or nearly whole time professors, with technical laboratories, biochemical and pathological, who with their assistant staff shall be engaged continually in irrigating our profession from the springs of the pure sciences. From the members of this department should radiate what is called an "atmosphere" through the wards. The majority of medical practitioners has to work upon the store of scientific facts with which they set out in practice. "Onwards they may gain in adaptiveness and technical facility, but can dig little deeper into the strata of knowledge; but for the modern academic spirit this would spell, as in history it has spelt stagnation. Therefore it is of the greater importance that every student should start on his career well equipped with scientific principles". For this reason the recent move to make medical colleges purely teaching institutions for the undergraduate students and concentrate postgraduate teaching and research work in special institutions to be created for this purpose is a move in the wrong direction and is to be condemned.

The main task of "progressive medicine" is to advance knowledge of medicine by research. "Research is the salt of the most practical training and it cannot begin too soon". So in every medical college a research department should be instituted. It must be realised that research is a whole time job and demands peculiar qualities. The first step in the starting of a research department is the recruitment of a group of medical graduates who have shown an aptitude for research and are willing to devote their lives primarily for research, making disease as it occurs in man the centre point of their studies. These recruits should possess a good grounding in the ancilliary sciences of mathematics, physics and chemistry. The essence of their training should be the development of correct methods of work and thought; accuracy of measurement; in biological science especially, a full understanding of the experimental method, a firm grasp of the nature and use of evidence; to know how to test and to weigh, to know how to sift out error, to be able to judge the truth or falsity of statements.

From the time of qualification the research worker should enjoy full freedom to develop along broad and recognised lines; he should have opportunity to acquire such technical methods as may be needed in the pursuit of given problems and freedom from recurring fear of failure as an expert and general diagnostician. He should have ample leisure to maintain close contacts with the department of physiology. A simultaneous step must be the assurance that careers will be provided for those who train themselves successfully. Young and competent men cannot be expected to hazard the best years of their lives in long and special training without reasonable prospect of corresponding careers before them.

It would be unreasonable to expect and it would be unwise to advocate the sudden creation of many posts; for there are not the adequately trained men to fill them. But the vicious circle now existing, whereby there can be no posts till there are trained men and no trained men till they can see the prospects of posts, must be broken. It can be done by a clear statement of policy that posts will be created for those who render themselves competent for such careers. The posts must be full time ones, for full time work only can ensure the leisure for efficient study and freedom from that most distracting of thoughts the imminence of an alternative career.

Research does not mean encouragement of transient research as it is done now in many colleges. Such work rarely possesses much scientific value, yet the publishing of such work has acquired a recognised commercial value and its realisation in the latter way becomes, more often than not, the real goal in view. The proper sequel of research is not practice but further research, a career largely concerned with investigations.

General hospitals provide the necessary wealth and diversity of material. The teaching staff of a general hospital sorts the material and renders it quickly available. The presence of such research departments in general hospitals stimulate teaching and links science and art. For these and other reasons these hospitals are very probably most suited to house such departments; and in this case these departments should enjoy independence from the more purely curative departments, they must in no sense be subordinated to these, as is the strong and natural present tendency. Research physicians and their departments require adequate but not abundant beds and proper laboratory facilities; there should be arrangements for exchange of patients with other departments of the same institution, ensuring by this means supply of material and relief from the care of patients no longer suited for research. The teaching of the research staff should be limited to the demonstration of new methods and observations and to the exposition of new ideas. The above suggestions for the development of a research department are culled

from the writings of Sir Thomas Lewis who is, perhaps, the greatest research worker of the present century and unrivalled in research experience and organisation.

"It is only by disinterested research on the large patient and prophetic lines of the pure sciences, can progress be made. The isolated academic workers, as well as the practitioner, loses by this isolation; he loses the spontaneous outcrops of problems and crucial instances which so often spring up in practice, but fail to show themselves in the laboratory. So complete and mischievous however has been the barrier between research and the industry of Medicine that a reaction from "laboratorism" to symptomatology has set in, because there are no intermediary workers, no engineers —between the knowledge getters and the knowledge dealers. Thus we see laboratory investigators completely out of touch with practice and the practitioners faithless of theoretical principles—just "Philistines".

NOTES AND NEWS

International Congress on Diseases of the Chest

The revised release from the Executive Director states that the correct dates for the VII International Congress on Diseases of the Chest sponsored by the American College of Chest Physicians in New Delhi are February 20-24, 1963 and not 1964 as announced previously.

International Conference on Alcohol and Road Traffic

The Third International Conference on Alcohol and Road Traffic will be held at B.M.A. House, Tavistock Square, London, on September 3-7, 1962.

His Royal Highness, the Duke of Edinburgh is its Patron and the British Minister of Transport, the President.

An International Committee and a Committee of Management have been appointed with Professor R. J. Wayne, Professor of the Practice of Medicine in the University of Glasgow, as Chairman of both Committees and Dr. J. D. J. Havard, Assistant Secretary of the British Medical Association, as their Secretary.

In the Plenary Sessions invited speakers will present papers covering (i) Law and law enforcement; (ii) Pharmacological, physiological, psychological aspects, including analytical methods; (iii) The sociological aspects, including accident statistics, public information and insurance.

Further information regarding the conference will be available from the Secretary of the Conference, B.M.A. House, Tavistock Square, London, W.C. 1.

Effects of Radioactivity on Human Body

Dr. Toshio Aoki, Director of the Hygiene Physics Department of the Japan Atomic Energy Research Institute drank five micro-curies of Strontium 85 in his coffee on August 16, 1961 to try and determine the effects of radioactivity in the human body.

Five micro-curies is a tenth of the maximum amount permitted without causing serious harm to the human body. It was estimately previously that 70 per cent of radioactivity which entered the body was ejected.

Dr. Aoki said his personal test and observations showed that more than 90 per cent of the Strontium 85 had been ejected from his body. Most of this was ejected in the first two days after he drank the coffee-strontium 'cocktail'.

Fellowships for Radiation Protection Course

The World Health Organisation has offered 24 fellowships for Indian nationals to attend a course in radiation protection during 1961. The course will be conducted at the Department of Atomic Energy, Bombay, from November 13 to December 2.

Pharmacists Urge Training Schools

Dr. S. Rohatgi, president, Pharmacy Council of India, said on 11-9-61 that while there had been considerable progress in the various branches of medical and health services, the training of pharmacists had remained most neglected.

The estimated shortage of practising pharmacists on an all-India basis which stood at 22,200 at present was likely to rise to 23,900 by the end of the third Plan if the present conditions of training continued.

Dr. Rohatgi appealed to all the State Governments to immediately start institutions for training pharmacists as laid down by the Pharmacy Act, 1948, or they would face a serious shortage of pharmacists soon.

He warned: "A situation might develop when it may not be possible to run the hospitals or dispensaries in the States in accordance with the Pharmacy Act."

All-India Paediatric Conference

The 12th All-India Paediatric Conference will be held at Jaipur on December 22-24, 1961. Dr. J. N. Pohowalla will preside.

Further information may be obtained from Dr. J. B. Mehta, the Organising Secretary of the Conference, S.M.S. Hospital, Jaipur, or Dr. S. P. Ghosal, Hony. Secretary, Indian Paediatric Society, 95 Dilkhusa Street, Calcutta 17.

Use of Cadaver Blood

The Haffkine Institute, Bombay, will soon work on the project of using human cadaver blood.

The use of human cadaver blood is in wide use in Soviet Russia and the Indian doctors who had gone there recently were greatly impressed with the results of the use of cadaver blood. Successful results obtained in Russia on the application of cadaver blood have encouraged medical experts in other countries to try this on emergency conditions.

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Enquiries made at the Haffkine Institute disclosed that they would be able to collect about five litres of blood from a person who dies in natural circumstances and this would enable the Institute to collect large quantities of cadaver blood and help them to increase the stocks of plasma which could be used in emergency cases.

It is pointed out here that ordinarily, they are able to collect from a healthy living person only about 250 c.c. of blood. A normal human being has 20 litres of blood in him. Only in big Indian cities the collection of cadaver blood is possible.

It is emphasised here that collection of cadaver blood is not an easy task. The most important factor is that the blood should be collected not later than two or three hours after death. After the collection, the pathologists will subject the blood to rigorous tests before it could be declared hundred per cent fit for transfusion.

It is hoped that the relatives of the persons whose cadaver blood is wanted will not object to the test. The medical authorities will certainly get their consent before they drain the blood from the dead person. It is also stated that the dead body will not suffer in shape or size as a result of extracting the blood from it. Medical experts also firmly believe that prejudice will not deter the successful implementation of this programme.

Watumull Awards, 1961

The following awards have been announced by the Watumull Foundation established in Honolulu, Hawaii in U.S.A. by Late G. J. Watumull :

1. Dr. Bal Krishna Anand, M.D., Professor of Physiology, All India Institute of Medical Sciences, New Delhi, for a study on The Physiology of the Central Nervous System.

2. Dr. Sachimohan Mukerjee, M.B., D.PHIL. (MED.), Senior Scientific Officer, Division of Microbiology, Indian Institute for Biochemistry and Experimental Medicine, Calcutta, for his invaluable studies on Typing of Cholera Vibrios by Bacteriophage.

3. Lt. Col. B. L. Raina, Director, Division of Family Planning, Ministry of Health, Government of India, New Delhi, for directing the Government of India's nation-wide programme of family planning and birth control.

4. Dr. Krishna Kumar Tewari, M.SC., Assistant Professor of Biochemistry, Lucknow University, U.P., India, for his several studies of Metaphosphates, an important and rather new field in biochemistry.

5. Dr. Boshi Sen, Director of the Vivekananda Laboratory, Almora, U.P., for his many-faceted practical and creative work in Agriculture, which has been of tremendous benefit to farmers all over India and has helped to raise the Agricultural yield of the country.

The awards will be conferred at a ceremony to be held in New Delhi in February 1962. In addition to a citation and a gold medal each recipient will be given Rs. 5,000 or $1,000 whichever is preferred by him.

Radiation Effect on Mice

The Osmania University is conducting experiments on the effects of radiation on mice with the ultimate aim of determining the effect of radiation on human beings.

Every month, a few dozens of "radiation-bearing" mice are sent by air from the United Kingdom. The research in the Osmania University is sponsored by the Atomic Energy Commission of the Government of India.

So far, the Osmania University has received 44 mice, eight from the Radio Biological Research Unit of the Atomic Energy Authority in Britain and the remaining 36 from the Laboratory of the Animal Centre of the British Medical Research Council. Another 100 mice are expected from Oakland in U.K.

The University proposes to take up research on the effects of radiation on flies.

Semi-Doctors

The Government of Madras will soon launch on a programme to train "semi-doctors" to meet the dearth of medical practitioners in the State, Mr. M. A. Manickavelu, Madras Health Minister, said on 14-9-61.

Mr. Manickavelu, who returned from Hyderabad after attending the conference of Health Ministers, told newsmen at the airport that the conference had decided on this programme, and had suggested it to the various State Governments. According to this programme young men and women with certain basic knowledge would be trained for a year and a half to make them fit for rendering medical aid for some of the common diseases.

Mr. Manickavelu described 'semi-doctors' as "more than a compounder but less than a fully-qualified doctor". He said that such a class of doctors was popular in Russia.

Asked about the reaction of the States to this proposal, the Minister said West Bengal did not agree to this because they claimed that they had fully met their requirements of medical practitioners in their State. Mysore had L.M.P.s in large numbers to meet their requirements. All the other States would have to agree to this proposal and Madras would soon move in this regard, he said.

Madras Medical Council Election

Drs. G. Sriramulu, K. Narayanamurthi, C. Nathamuni, D. R. Varman, K. Rama Rao, D. V. Venkappa and V. Vijayaraghavan have been elected as members of the Madras Medical Council from among the registered practitioners of the State for a term of five years on and from the 3rd November 1961. They were the only candidates duly nominated for the vacancies.

Donates Body after Death

Not satisfied with donating blood over 40 times, Mr. S. V. Narasimha Rao, an advocate of Gudur, Nellore district, has now registered a will bequeathing his body to the Superintendent, Osmania General Hospital.

The will also states that after his death his eyes should be preserved for the needy.

REVIEWS

Advances in Pediatrics, Vol. XI—Edited by S. Z. Levine; 1960, The Year Book Publishers, Inc., Chicago 11, Illinois, U.S.A.; 9"×6", pp. 285; $9.00.

This latest volume of the well-known 'advances' series on paediatrics largely fulfils the expectation that it evokes among medical scientists generally and paediatricians in particular. The six subjects dealt with, though by no means new to paediatricians, are refreshingly provocative—being based on original and recent researches at some of the renowned paediatric centres in the Americas.

A moral that needs to be noted at the outset is that medicine at the present time is very largely a function of the clinician and the basic research worker working in close collaboration. And, clinicians today can fulfil their role only if they are so oriented.

The subjects included in this volume are: Respiration and respiratory problems of the newborn, Sodium metabolism and the central nervous system, Allergy, Infantile diarrhoea and its ambulatory treatment, Aminoaciduria, and lastly, Hormone therapy in rheumatic fever.

In every country, whether with high living standards and medical care or otherwise, respiratory disorders constitute the big majority of perinatal mortality and morbidity. Studies of fundamental nature as described in the book are therefore of practical interest to paediatricians the world over. They relate to morphological, histochemical and biochemical factors in the genesis and development of the lungs, the kinetics of lung expansion and the concomitant vascular changes. The physiology of the sustenance of respiration also receives due attention. The clinical section of the chapter deals with the variety of congenital and acquired pulmonary conditions, including the recently discovered entities, leading to the so-called 'respiratory distress syndrome' of the newborn. The radiographs are commendable.

In Chapter II, a convincing case appears to have been made out for more attention to be paid to the interrelation between sodium metabolism and brain function, not merely in relation to acute illnesses and their management but also to the possibility of adverse and long-term sequelae. The physiological as well as pathophysiological processes involved in both hypernatraemic and hyponatraemic states have been discussed correlating them to actual clinical conditions.

The ever-baffling problem of allergy is reviewed in the following chapter and an attempt made to classify the various subtypes loosely grouped under allergy on the basis of presence or otherwise of humoral antibodies. It would appear that further and renewed work is justified on the possibility of active sensitisation *in utero*. Clinical experiments and management of allergic states as carried out in the centre in question are described in some detail.

The chapter on infantile diarrhoea and dehydration coming from a centre in Chile will no doubt give to a reader in this country the feeling of being on home ground. The morbidity and mortality statistics and the epidemiological factors enunciated are all too familiar. Nothing much has been added to what is known of the control and treatment of infantile diarrhoea. But, what is of interest is the experiment with Emergency Hydration Centres for ambulatory treatment of the not too serious cases. Being in the similar situation of lack of adequate hospital accommodation and the necessity to spare hospital beds for the very grave cases, paediatricians of this country would do well to study such scientific improvisations to meet objective situations.

The chapter on aminoaciduria is a good short survey of a subject that newer identifying techniques have made possible to be studied in some detail only recently. The article may stimulate further study in an area that is yet largely uncharted.

The section on hormone therapy in rheumatic fever deals specifically with the results of treatment of active carditis in 89 patients. The author has demonstrated, as clearly as our current clinical and laboratory criteria would permit, that adequate short-term therapy with hormones will arrest the inflammatory process, shorten its duration and prevent or at least minimise cardiac damage.

All the chapters of the book are followed as usual by extensive references.

SISIR K. BOSE

Evaluation of Drug Therapy—Edited by Francis M. Foster; 1961, The University of Wisconsin Press, Madison 6, Wis. U.S.A.; 8½"×6½", pp. xxiv+167; $4·00.

This book is a record of the proceedings of a symposium held at the University of Wisconsin in 1960. A large variety of subjects based particularly on neurological and sensory diseases were discussed by special panels and specialists have participated and given their valued views on how to evaluate drug therapy in such conditions. Although broad-based suggestions have been made about procedures, clinical methods and method of approach, it is regretted that there have not been much of actual laboratory methods, data and rules for guidance for those in laboratories interested in the subject. The book contains valuable suggestions for clinical approach and as such would be of interest to those who combine research with clinical medicine. The get-up, printing and binding are good.

S. P. DE

Surgery of the Acute Abdomen—By John A. Shepherd; 1960, E. & S. Livingstone Ltd., Edinburgh; 10"×6", pp. xii+1228; £5 net.

The book is complete on the subject although it lacks in illustrations. It has made every attempt to make a complex subject simpler. The reviewer firmly believes that the book will be very useful to every general surgeon particularly to those dealing with emergency surgery.

A. K. D. G.

SUPPLEMENT
Journal of the Indian Medical Association

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ASSOCIATION NOTES

Dr. Salil Dutt, Hony. Joint Secretary of I.M.A. has addressed the following letter on August 18, 1961 to the Central Wage Board for Tea Plantation Industry with recommendations of I.M.A. for Pay Scales etc. for medical officers.

"Dear Sir,

We thank you for your letter No. 3/2/TWB-1765 dated 25th July, 1961 with its enclosure. The questionnaire which you said to have been sent has not yet reached this office in spite of sending a reminder on the 9th instant.

As the time is short, we are sending herewith the General Recommendations of the Indian Medical Association re. Pay Scale of Doctors for your information and sympathetic consideration.

In this connection, we would like to point out to you that the Indian Medical Association was in correspondence with you since January, 1961 and it is really surprising to note that the Wage Board did not consider it necessary to send the questionaire before, though they have already sent it to different other organisations.

The Indian Medical Association, the only National Medical Association in India as recognised by the World Medical Association has been trying to improve the service conditions of the medical officers working in different Tea Gardens since the year 1951 and not only for West Bengal but for Assam, U.P. and Anamalais.

There are about 3,000 doctors serving in Tea Plantations all over India and the majority of them are in Assam. There are a few in Uttar Pradesh and the Anamalis Plantation. These doctors are designated as A.M.O s.

These doctors are in charge of the treatment of indoor and outdoor patients. In addition, they have to do laboratory work, anti-malaria work, maternity and child welfare work and public health work such as vaccination, inoculation, etc. and they are practically responsible for the health services for the whole population of the Gardens.

It has also been pointed out that these A.M.O.s work under different circumstances with no amenities for educating their children and with no facilities for any sort of social, recreational or cultural activities.

The legitimate holidays and religious festivals are not enjoyed and that much scope is not available for Post-Graduate training. The prospects of promotion in most of these gardens are not very good.

While the responsibilities and work of these medical officers are in no way inferior to that done by officers in other departments of Industry, their status is not equal to the status of officers in other departments.

At present there is no security of service and very often their continuance or otherwise depends on the whims and fancies of those in authority. All Asstt. Medical Officers were very keen that their security must be covered by some Act or legislation and all points of dispute with regard to punishment, dismissal, etc. should be referred to an impartial body, preferably of medical men.

The present Plantation Labour Act of 1951 in its definition of 'worker' excludes Medical Officers, working in the plantations. This is seen on page 2 of the Plantation Labour Act. Plantation Labour Act will not be helpful to medical men as it deals with matters pertaining to health, welfare, hours of work and leave with wages. It cannot and does not cover security of tenure.

The next course would be to find out if it is possible to introduce a Bill on the lines of the Working Journalists Act. This could be called the Plantation Medical Officers (Conditions of Service) and Miscellaneous Provisions Act. Labour is a concurrent subject and health is a State subject and both the State and the Central Governments can legislate with regard to Labour problems. On the analogy to the Working Journalists (conditions of services) and Miscellaneous Provisions Act 1955 which received assent on 20-12 1955, a similar Bill could be introduced for the benefit of Plantation Medical Officers. This could either be done by the Government itself or a private member could introduce such a Bill either in Parliament or the State Legislature. Of course, to succeed, it has to get the support of the Government also.

In conclusion, I shall be glad to meet you in a deputation with a view to discuss further in the matter over the table and we shall feel extremely grateful if you kindly fix up a date and time after 30th of this month as the undersigned will be away from the city to attend a meeting of the Indian Medical Association at Nainital where the subject will be considered and I will let you know immediately, of any further development in this connection.

Thanking you once again and assuring you of our whole-hearted help and co-operation in this connection.

Yours faithfully,
Sd/- SALIL DUTT
Hony. Joint Secretary
Indian Medical Association

GENERAL RECOMMENDATIONS OF THE I.M.A. FOR PAY SCALES, ETC. FOR M.O.s

I. *Recruitment*

All recruitment should ordinarily be through the Union or State Service Commissions only, as the case may be.

II. *Age of initial recruitment*

The age limit for entry into the service be fixed up to 35 years.

III. *Status and designation*

1. All medical men in the service should be treated as officers.
2. The designation of the doctors will be Medical Officers.

IV. *Remuneration*

Keeping in view the present cost of living index in the country and those mentioned in paragraph hereinabove and the conditions as enunciated above under which the doctors in employment are expected to work and discharge their duties, the I.M.A. recommends that there should be a uniform scale of pay for medical per-

sons in all parts of the country and the following grades with consolidated pay scales be constituted :

Junior Scale	:	525-30-675-35-850 EB 40-1250
Senior Scale	:	1000-50-1300-60-1600-60-2200
Selection Grade	:	2200-100-2500
Special Posts	:	2250-125-3000

N.B. The attention of the Government is specially drawn to the following.

In view of the medical man usually joining service at a later age than an officer in the I.A.S., etc., a higher suitable starting salary (4 increments) in the Junior Scale should be given. Such a practice is followed in the Armed Forces between combatant officers and medical officers in the Armed Forces Medical Service.

2. No private practice should be allowed to the doctors when employed on whole-time basis.

In special and exception cases where qualified men are not available, e.g., in rural areas where there are no other medical men or where in a matter of consultation or expert advice not otherwise available in the locality, limited practice may be allowed in a definite schedule of fees, part of which should be credited to the management.

V. *Cadre*

(i) Junior Scale :—should be open to all registered medical practitioners whether Licentiates or Graduates.

(ii) Senior Scale :—Normally officers in the Junior Scale with sufficient experience and/or special qualifications should be promoted to the Senior Scale as is done in the I.A.S., I.F.S., etc.

Provision should, however, be made for direct recruitment to Senior Scale from amongst candidates with suitable experience and/or qualification.

The Asstt. Professors or Readers, Dist. Medical officers, Asstt. Director of Research, Deputy Directors, etc. should normally be appointed in the Senior Scale with their starting salary depending on their age and experience.

(iii) Selection Grade and Special Posts should be meant for Director General, Health Services, Director of Health Services, Chief Medical Officers of Railways, Professors in Medical Colleges, Senior Specialists and Consultants, Director, Research Institutes, etc., etc.

N.B. The Association wishes to stress that there should not be any difference in status and remuneration between administrative heads on the one hand and professors, senior specialists and research workers on the other hand to avoid scientific personnel giving up scientific work and hankering after administrative posts.

VI. *Allowance*

1. Persons with special qualifications or training or experience should be allowed extra allowance of Rs. 100/- a month while in the Junior Scale.

2. Doctors should be provided with free residential accommodation. In addition, there should be a compensatory allowance, the amount of compensation depending on all factors concerned like education of children, the minimum being 25 per cent of the pay.

3(a). All other allowances, e.g., City Allowance, House Rent Allowance, Dearness Allowance, etc. and other facilities like Medical Aid, Provident Fund, Pension, Gratuity, etc., should be admissible to medical men as in the case of Class I Officers in the Central Government.

3(b). When the medical men are on call for 24 hours of the day and night and have to give professional attendance beyond duty hours, they should be entitled to extra remuneration either consolidated amount or on the basis of fee for service rendered, as may be mutually agreed.

VII. *Leave and other privileges*

(a) In lieu of gazetted public holidays and weekly holidays, viz., Sunday and half Saturdays not enjoyed by a doctor, special compensatory leave should be given.

(b) Study Leave—It is suggested that 6 months Study Leave after 6 years of service be allowed and may be permitted to be combined with the accumulated privilege leave or furlough.

(c) Refresher Course Leave—After every 5 years, doctors should be allowed leave to attend Refresher Courses, for which facilities should be provided. The period spent during the Refresher Courses should be treated as duty.

VIII. *Age of retirement*

The age of retirement in case of medical men should be 60 years because of their joining the service at higher age.

IX. *General*

(a) Hours of work—Usual working hours of civil servants should be made applicable to the doctors as well.

(b) Strength of Medical Services—Strength of medical personnel should be considerably increased because of usual over-crowding both in the out and inpatient departments of hospitals and dispensaries.

(c) In order to solve the above difficulties, medical officers both specialists and general practitioners should be employed on a part time basis wherever necessary on the following terms :

1. For specialists, the remuneration should be :
One Session a week of up to 3 hours duration each Rs. 125/- a month
Two Sessions a week of up to 3 hours duration Rs. 200/- a month
Three Sessions a week of up to 3 hours duration each Rs. 275/- a month
Four Sessions a week of up to 3 hours duration each Rs. 300/- a month
Five Sessions a week of up to 3 hours duration each Rs. 400/- a month
Six Sessions a week of up to 3 hours duration each Rs. 500/- a month.
Extra attendance for consultation or visit—Rs. 20/- per visit during day or Rs. 40/- during night.

2. For general practitioners, the remuneration may be fixed at fifty per cent of the above remuneration as for the specialists.

BRANCH NOTES

ALIGARH BRANCH—A general meeting of the branch was held on 29-7-61 in the Safi Hall of M.U.I.O., Gandhi Eye Hospital, Aligarh. The minutes of the last meeting read by the secretary were confirmed by the house. Letter and the booklet concerning the U.P. Government notification about B.M.B.S. were read by the secretary. Members participated in the discussions and a resolution was passed by the house to be sent to the U. P. Government. Election of the president and vice-presidents of the State and All-India Executive was held.

BHILAI STEEL PROJECT BRANCH—A clinical meeting was held at Sector I Hospital on 20-7-61. The following cases were presented—1. A case of Cellulitis of Face by Dr. Miss K. Punsani, 2. Carcinoma of Thyroid with Metastatic Neck Glands—Dr. N. L. Kalle, 3. A case of Teratoma Ovary—Dr. N. L. Kalle, 4. Tuberculosis of Neck Glands along with Metastasis (squamous cell carcinoma) from a Nasopharyngeal Tumour.—Dr. N. L. Kalle, Gumma of the Left Tonsil with Tropical Eosinophilia—Dr. Kulkarni and Idnani.

A clinical meeting was held at Sector I Hospital on 3-8-61. The following cases were presented: 1. A case of Kala-azar—Dr. D. C. Sen and 2. A case of Stevens-Johnson Syndrome—Dr. D. C. Sen, Dr. N. L. Kalle, C.M.O. gave a talk on 'Closed Chest Resuscitation'.

A clinical meeting was held at Sector I Hospital on 17-8-61 with the following agenda:

1. A talk by Dr. Mankodi on desirability of opening a branch of Society of Industrial Medicine at Bhilai and 2. A discussion on "Male Factors in Sterility—the participants were (1) Dr. Rao and (2) Dr. N. L. Kalle.

BHOPAL BRANCH—A meeting of the branch was held on 4-9-61. A symposium on Hypertension was held in the Lecture Hall of Gandhi Medical College, Bhopal. Dr. S. M. Misra, Professor of Medicine, was the chairman of the symposium. 54 doctors attended the meeting. The following members took part in the symposium. Dr. Ajai Shankar (Aetiology), Dr. P. L. Tandon (Pathology), Dr. R. K. Bhargava (Clinical Symptomatology), Dr. S. Singh (Fundus changes), Dr. D. Singh (Medical Treatment), Dr. M. Kumar (Surgical Treatment), Dr. C. B. Seth, Dr. S. L. Jain, Dr. S. S. Gupta took part in discussion.

Dr. S. M. Misra in his concluding remarks thanked the various speakers and laid special emphasis on the normal blood pressure, demarcating between normal and abnormal pressures, and the pitfalls in the diagnosis of hypertension.

BOMBAY BRANCH—At the General Body Meeting held on the 20th August 1961, at Seth G. S. Medical College, Main Lecture Theatre, Parel, the following office-bearers and members of the managing committee for the year 1960-61 were declared elected: Dr. Shantilal C. Sheth—president; Dr. A. D. Daftary and Dr. K. K. Datey—vice presidents; Dr. Nagindas N. Shah and Dr. D. S. Munagekar hon. jt. secretaries and Dr. Gope D. Lalwani—hon. treasurer.

Dr. R. V. Sathe who was elected as President for the 37th All India Medical Conference for the year 1960-61 was received at the V. T. Station on his arrival from Nainital and garlanded by the President of the Bombay Territorial Branch and other members.

BOMBAY TERRITORIAL BRANCH—A clinical lecture was arranged on 20-4-61 when Dr. Creutzfeldt from Germany attached to Hoeschst Pharmaceuticals Ld. as a Research Director spoke on the use of Antibiotic Drugs and their Application. The lecture was mainly devoted to Sulphonylureas. Dr. Creutzfeldt in conclusion described the mode of action of Sulphonylureas in the following words:

1. Their effect in the organism depends upon sufficient endogenous insulin production.
2. The substances influence the insulin release of the beta-cells.
3. Potentiation of exogenous insulin doses can be proved but is too weak to be of practical significance.
4. The site of the anti-diabetic action is the liver and not the periphery. The sulphonylureas inhibit the production and/or the release of glucose in the liver.
5. It is possible but not proved that the metabolic changes occurring in the liver through the sulphonylureas are effected through endogenously liberated insulin. This could mean that there is an important effect of the sulphonylureas increasing hepatic responsiveness to endogenous insulin.
6. One must distinguish between the findings in the animal experiment and in the healthy human on one hand, and the behaviour found in the maturity-onset diabetic on the other. It is believed that the disorder in this type of diabetes can only be treated symptomatically with insulin. It can at least partially be corrected however, through the sulphonylureas.
7. Corrective treatment of the maturity-onset diabetes with the sulphonylureas causes no improvement in the carbohydrate tolerance, because the beta-cell capacity is not improved. Two theories for the antidiabetic effect are possible, the first supposing the principle mode of action of the sulphonylureas as being as insulin secretion stimulation suggests in the diabetic an improvement of the hypothetical disturbance of the insulin release from the beta-cells. The second theory supposing the effect of the sulphonylureas as being mainly an influence on the glucose release of the liver suggests in the diabetic a decrease of the glucose production.

L—R: DR. CREUTZFELDT (LECTURER), DR. SURESH C. SHETH (PRESIDENT) AND DR. A. D. DAFTARY (HONY. JOINT SECRETARY).

Dr. Suresh C. Sheth presided on the occasion. The lecture was very interesting and there was good attendance.

At the end of the lecture Dr. Suresh C. Sheth (President) spoke on the Utility of Antidiabetic Drugs. Dr. A. D. Daftary proposed vote of thanks to the main lecturer Dr. Creutzfeldt.

A Seminar on 'Impotency' was arranged under the joint auspices of the Bombay Territorial Branch and Bombay Branch, I.M.A., on 26-6-61 at Birla Matushri Sabhaghar. The following members participated in the Seminar.

Dr. Arthur De Sa, Dr. J. C. Patel, Dr. K. R. Masani, Dr. Mrs. Lalitha Rao, Dr. Homi S. Mehta, Dr. B. N. Purandare, Dr. D. S. Munagekar. Dr. R. V. Sathe presided. Dr. Arthur De Sa spoke on Surgical Aspect. Dr. J. C. Patel spoke on Medical Aspect, Dr. Homi S. Mehta spoke on Medicolegal Aspect, Dr. K. R. Masani spoke on Psychiatric Aspect, Dr. B. N. Purandare spoke on Impotency in Females. Dr. D. S. Munagekar and Dr. Mrs. Lalitha Rao spoke from their experience as general practitioners.

The Seminar was very interesting as interesting stories were given by Dr. K. R. Masani and Dr. Homi S. Mehta. Dr. R. V. Sathe summarised the whole Seminar.

CHAPRA BRANCH—A meeting of the executive Committee of the branch was held on 8-8-61 to discuss certain important matters at the residence of the President.

A monthly meeting of the branch was held on 10-9-61 in the Verma Medical Hall presided by Dr. Akhoury B. P. Sinha. Election of president and vice-presidents were conducted for the XXI Bihar Provincial Medical Conference. The following office-bearers were elected for

the coming year : President—Dr. Akhoury B. P. Sinha; Vice-Presidents—Dr. Kamla Banerjee and Dr. Kandhjee Sahay; Secretary—Dr. L. P. Verma; Jt. Secretary—Dr. Sridhar Mukund; Member of the Central Council—Dr. L. P. Verma, alternate member—Dr. Sridhar Mukund. Representative to the Provincial Council—Dr. H. K. Das, Dr. J. N. Chaudhury and Dr. L. P. Verma. The following films were shown : 1. A film on 'Saquil', 2. A film on 'Kenacort', 3. A film on 'Fungus infection and Mysteclin'. A large number of doctors attended the show.

COIMBATORE BRANCH—The monthly meeting of the branch was held on the 1st July 1961 at 6 P.M. in the premises of the Association. About 60 members were present. Dr. G. T. Gopalakrishna Naidu, the President, presided.

Dr. V. Sriramulu, the Hony. Secretary, read the minutes of the previous meeting of the Association held on 13-5-61, which were approved. A condolence resolution was passed in memory of the late Dr. (Lt. Col.) T. S. S. Shastry, I.M.S., who was a member of the Indian Medical Association for a long time through the Madras City Branch of I.M.A. and the Hony. Secretary was desired to communicate the same to the bereaved members of the family.

The President, thereafter, called for nomination for the posts of one president and two vice-presidents of the Madras State Branch of I.M.A. The Hony. Secretary was requested to communicate the result of this nomination to the Madras State Branch of I.M.A. according to the usual procedure.

The Hony. Secretary then suggested to the general body that it was proposed to conduct a Refresher Course for the members under the auspices of the Association and sought the views of the house over the matter. After taking the consensus of opinion, it was decided to to bring this subject before a meeting of the Managing Committee to chalk out plans in this regard.

The President then introduced Dr. Miss Pennu Isaiah, the Speaker for the Day, and requested her to address the gathering. Dr. Miss Pennu Isaiah then gave a very interesting talk on Induction of Labour after which there was the usual discussion in which several members took part.

The monthly meeting of the branch was held on the 12th July 1961 at 6 P.M. in the premises of the Association. 68 members were present. Dr. G. T. Gopalakrishna Naidu, the President, presided. After Tea, the President welcomed the members. He spoke about the misery caused to the general public by the floods in several parts of the State and appealed to the members to do their duty and render services to the flood-stricken people.

Dr. V. Sriramulu, the Hony. Secretary, then read the minutes of the previous meeting of the branch held on 1-7-61 which were confirmed.

The election of one president and three vice-presidents of the Central I.M.A. for the year 1961-62 was then proceeded with, the voting being by secret ballot. Three new members were introduced by the Hony. Secretary and duly admitted.

The president thereafter introduced Dr. S. Padmavathy of the Lady Hardinge Medical College, Delhi, the Speaker for the Day, and requested her to address the gathering. Dr. S. Padmavathy then gave a very interesting talk on the Aetiology and Management of Congestive Heart Failure. The president complimented the Speaker on the erudite manner of her handling the subject for the day.

The monthly meeting of the branch was held on the 12th August 1961 at 6 P.M. in the premises of the Association. 60 members were present. In the unavoidable absence of the president, the vice-president, Dr. C. V. Ramaraj, presided.

After Tea, the Chairman of the meeting welcomed the gathering. Condolence resolution was passed touching the death of Dr. U. Krishna Rau, an eldest member of the Indian Medical Association and one of the past presidents of the Madras State Branch of the I.M.A. In a short moving speech, the Chairman eulogised his services to the cause of the Association, and paid a glowing tribute to his devoted and sincere interest in all matters in which he was concerned, and said that the void created by his death in the society and in the medical profession cannot be easily filled. After paying homage to the departed soul, the following resolution was passed unanimously, all the members standing in silence for a couple of minutes :

> "This meeting of the Coimbatore Dt. Medical Association records with deep regret the sad and sudden demise of one of the oldest and most valued members of the Indian Medical Association, Dr. U. Krishna Rau. Dr. Krishna Rau was one of the pillars of the Association and a past president of the Madras State Branch of I.M.A. the loss of whom is keenly felt by all the members. The hony. secretary is requested to communicate this resolution to the members of the bereaved family".

Dr. V. Sriramulu, the Hony. Secretary, then read the minutes of the previous meeting held on 12th July 1961 as well as the minutes of the meetings of the Managing Committee held subsequently and the proceedings of the meeting of the Sub-Committee constituted for conducting the Short Refresher Course, and the minutes of all these meetings were approved. The circulars received from the I.M.A. Central and the State Branch were then read and recorded.

The election of two vice-presidents for the Madras State Branch of I.M.A. for the year 1961-62 was thereafter held, the voting being by secret ballot.

The Chairman thereupon introduced to the gathering the Speaker of the Day, Dr. A. N. K. Menon, Head of the Department of Radiology, Stanley Medical College and Hospital, Madras, and requested him to address the meeting. Dr. A. N. K. Menon then delivered his address on Radiological Diagnosis of the Congenital Heart Disease and illustrated his talk by projecting slides on the projector and X-ray pictures on the episcope. Dr. P. K. Kalyanaraman, Hony. Physician, Government Headquarters Hospital, Coimbatore, supplemented the lecture. The Chairman thanked the Speaker for his erudite handling of the subject and the others who took part in the discussion.

DELHI STATE BRANCH—The branch celebrated the independence day on the 14th August, 1961, in DMA Hall, Daryaganj, Delhi, at 4-30 P.M. The ceremony was organised in a ceremonial manner by Dr. G. D. Dhalla, Hony. Secretary, D.M.A. and the flag was unfurled by Dr. Mool Singh Bazaz amidst cheers from a large number of members who witnessed the ceremony. Dr. P. C. Bhatia, President, D.M.A. praised the services of those patriots whose sacrifices had led the country to the goal of freedom. He paid tributes to the father of the nation Mahatma Gandhi who had led the country to the path of freedom in his own non-violent way. Last year on this very day Lt. Col. Amir Chand had laid the foundation stone of the new building of D.M.A. which was now going up at good speed. Dr. Mool Singh Bazaz, the oldest member present at the function unfurled the national flag and narrated in brief the services rendered by the D.M.A. to the profession and people of Delhi. Requesting Lt. Col. Amir Chand to speak on the occasion the president complimented him for his continued guidance, service and devotion towards the cause of D.M.A. It was a good coincidence he said that 14th August, was a sacred day for D.M.A. because of this day D.M.A. was first founded in the year 1914.

Lt. Col. Amir Chand in his address thanked the President for the remarks and requested the members to do their duty towards D.M.A. by generously contributing towards its Building Fund. He was lustily

cheered because members felt his presence amongst them had added a special charm to the function. National Anthem was sung by the members and they were led to an At Home by Dr. Daljeet Singh, hony. jt. Secretary, D.M.A.

ERODE BRANCH—A meeting of the branch, was held on 24-6-61, Dr. E. S. Venkataraman presiding, Dr. D. Lakshmanan spoke on Common Surgical Emergencies, Some Aspects. The lecturer covered all important Surgical Emergencies and their treatment in the course of 2 hours talk. Dr. B. S. Viswanathan was the host.

Another meeting was held on 12-7-61, Dr. L. K. Muthuswamy presiding, Dr. P. N. Rangiah, Director, Department of Venereology, Government General Hospital, Madras, spoke on The Problem of Trichomoniasis in Venereology. The lecturer discussed the intractable nature of the disease and the problem posed by it for successful treatment. 35 doctors attended. Dr. K. V. Kunhikannan was the host.

FAIZABAD BRANCH—A meeting of the Indian Medical Association was held on 27-7-61 at the Tilak Hall at 7 P.M. Dr. S. K. Mukerji presided. Dr. R. N. Tandan was the guest of honour.

Dr. R. N. Tandan (from Lucknow) specialist in Tuberculosis gave a talk on Tuberculosis. He dwelt in detail on the differential diagnosis and narrated cases from his experience. Drs. S. A. Khan, Akhtar Hussain, S. K. Mukerji, Y. D. Kapur, H. L. Gupta, P. N. Banerji, took part in discussion.

GIRIDIH BRANCH—A clinical meeting was held on 2-6 61, attended by 10 members. A number of x-ray plates of interest were demonstrated by Dr. I. Ahmad followed by discussion.

A dinner meeting was held at Beniadih on the 15th July 1961 at the residence of Dr. A. B. Roy. The gathering was large. The president Dr. H. Chatterji congratulated Dr. A. B. Roy on his promotion as Assistant Suregon.

Nomination for President and Vice-Presidentship of I.M.A. centre were made.

At a special meeting on 9-9-61 where 11 members were present the nomination for presidentship and vice-presidentship of the State were made. On the initiative of the president Dr. H. Chatterji a resolution was passed to request the Municipality for the gift of a plot of land to enable this branch to have an I.M.A. house of its own.

GONDAL BRANCH—The yearly meeting of I.M.A. Gondal Branch was held at Alco Chemical Industries Private Limited on 10-9-61. The following were elected the office bearers for the year 1961-62: Dr. V. P. Pandya—President, Dr. R. P. Kamdar, Vice-president, Dr. K. J. Upadhyaya—Hony. Secretary.

The meeting of the branch is held on the first Friday of every month at the Government Hospital. This year, the Association is going to give Triple Vaccine to all the infants of the city with the co-operation of the Gondal Municipality. Baby health show was arranged with the co-operation of the Rotary Club of Gondal, where about 200 children took part in the competitions.

GUJARAT, SAURASHTRA AND KUTCH TERRITORIAL BRANCH—At the annual meeting of the Territorial Council of the branch, the following members have been elected for the year 1961-62 as representatives and alternate representative on the Working Committee of the I.M.A.: Dr. A. P. Shukla and Dr. P. R. Trivedi—Representatives; Dr. C. G. Gandhi and Dr. I. G. Bhatt—Alternates.

JAGATDAL BRANCH—An ordinary meeting of the branch of I.M.A. was held on 10-9-61 at Bhatpara high school. The death of Dr. Subodh Mitra was condoled and members observed silence for two minutes. Dr. T. D. Majumdar, Dermatologist N.R.S. Medical College, Calcutta spoke on the subject of Allergic Dermatosis.

JALPAIGURI BRANCH—The following resolution was passed on the death of late Dr. Subodh Mitra. "The members of the I.M.A. Jalpaiguri branch express its deep sense of sorrow at the sad demise of Dr. Subodh Kumar Mitra at an early age of 65, which took place on the 4th. of September at Vienna. Dr. Mitra was not only a gynaecologist but also showed his eminence in the treatment of Cancer and his "Mitra's operation on Cancer Uterus" earned international reputation. He was the Director of Cancer hospital, Calcutta. His extra-medical activities through R.W.A.C. of which he was the Commandant and one of the Chief Organisers, for the relief of the distressed, made him very popular as a kind hearted man. Towards the fag end of his life he was made Vice-Chancellor of the Calcutta University.

The members pray to the Almighty to keep his soul in peace and express deep sympathy with the members of his bereaved family."

JAMUI BRANCH—A general meeting of the branch was held on 11-8-61 with Dr. K. C. Sanyal in the chair. Five members were present. Voting for the President and 3 Vice-Presidents of the I.M.A. (Centre) was held. It was also decided to send Rs. 25/- to the Hony. Secretary, I.M.A.—Poona Branch, for Poona Flood Relief Fund. The meeting dispersed after a dinner by the host Dr. K. C. Sanyal.

The annual meeting of the branch was held on 9-9-61 with Dr. K. C. Sanyal in the chair. Six members were present. Voting for the president and vice-presidents for the Bihar State Branch of I.M.A. was held. The following office bearers of the local branch were elected: President—Dr. K. C. Sanyal; Vice-President—Dr. R. S. Ram; Hony. Secretary—Dr. R. B. Prosad; Hony. Jt. Secretary—Dr. (Miss) S. Kaskar; Member of the State Council—Dr. M. P. Verma.

The general and the Health Week accounts for the session 1960-61 were passed. The meeting dispersed after a dinner by the host Dr. R. S. Ram.

KAIRA BRANCH—The general meeting of branch was held on the 10th September, 1961 at Kaira and the following office bearers were elected for the year 1961-62: President—Dr. Umar Mubarak Siddi; Vice-President—Dr. R. P. Gandhi; Hony. Secretary—Dr. Ochchhavial M. Shah; Hon. Jt. Secretary—Dr. M. B. Pandya; Delegate—Dr. Ramanlal M. Shah.

KALYANI BRANCH—A general meeting of the branch was held on September 1, 1961. Dr. Ranes Chakravarty of S. S. K. M. Hospital spoke on Carcinomas. It was attended by about forty doctors.

A meeting of the branch was held on 7-9-61 to condole the death of Dr. Subodh Mitra, Vice-Chancellor, Calcutta University and Founder-Director, Chittaranjan National Cancer Research Institute. A copy of the following resolution was sent to the members of the bereaved family. "Resolved that this meeting of the Kalyani Branch of the Indian Medical Association places on record its deep sense of sorrow at the sad demise of Dr. Subodh Mitra and expresses its heart-felt sympathy to the members of the bereaved family."

KANPUR BRANCH—A clinical meeting was held on 21st July 1961 under the presidentship of Dr. Miss C. Rohatgi at 4-30 P.M. at the Temple of Service, Kanpur. Dr. S. P. Srivastava spoke on Cancer Problem in India, interesting discussion followed in which Dr. S. C. Jain, Dr. S. N. Kapoor and Dr. Satwant Singh, Dr. A. K. Gupta took part.

A clinical meeting was held on the 18-8-1961 at the "Temple of Service". Dr. Miss C. Rohatgi presided. There was a panel discussion on hypertension. Introduction of the subject was done by Dr. K. N. Gour, Professor of Medicine, G. S. V. M. Medical College, Kanpur. Question master was Dr. S. C. Jain, Reader in medicine; members of the panel were Dr. D. Paul, Dr. B. K. Gupta, Dr. P. D. P. Mathur, Dr. K. K. Sikka.

Dr. S. C. Jain wound up the panel discussion. Dr. Satwant Singh thanked the members of the panel, Dr. Jain and Dr. Gaur for taking keen interest in organising the panel.

A clinical meeting was held on the 25th August 1961 at 4-30 P.M. at the Temple of Service, Kanpur. Dr. H. B. Variava occupied the chair. Dr. B. K. Gupta demonstrated a case of Pellagra; interesting discussion followed in which various members took part. Dr. Satwant Singh thanked the speaker.

A clinical meeting was held on the 8th September 1961 under the presidentship of Dr. Miss C. Rohatgi. Dr. K. C. Samuel, Reader in Pathology, G. S. V. M. Medical College, Kanpur gave a lecture on Nephrotic Syndrome followed by an interesting discussion.

A clinical meeting was held on the 15th September, 1961, under the presidentship of Dr. P. N. Bajpai.

Dr.B. K. Gupta Lecturer in Medicine, G.S.V.M. Medical College, Kanpur gave a lecture on Modern treatment and Management of Nephrotic Syndrome; interesting discussion followed.

KARIMNAGAR BRANCH—The clinical meeting of the branch for the month of August 1961 was held on 6-8-61 at the Headquarters Hospital, Karimnagar, with Dr. Ahmed Hussain, Superintendent and D.M.O. in the chair. This meeting has been specially called for, for the election of office-bearers to the Central Council. The election was conducted by secret ballot, by the members present in the meeting.

Dr. C. S. Murthy, Dental Assistant Surgeon, Headquarters Hospital, Karimnagar, dealt with the implications of Impaction of Tooth, and its management. After this the Superintendent and D.M.O. Karimnagar asked the speaker whether extraction of tooth can be done on patients suffering from heart disease, to which the speaker replied suitably.

Dr. Jagdish Ram-Pershal, Medical Officer, Chendurthi, narrated a case where he found all signs and symptoms pertaining to Encephalitis and after treatment with broad spectrum antibiotics, the patient recovered but leaving behind paralysis of the right leg which gives rise to suspicion whether the case was one of simple Meningitis or a case of acute Poliomyelitis. Majority of the members who participated in the discussion felt the case to be a case of Poliomyelitis.

Dr. Afzal Ali, Medical Officer, Headquarters Hospital, Karimnagar, presented a case of 'Chorea' and described briefly the signs and symptoms, differential diagnosis, and management of a case of Chorea.

Dr. Ahmed Hussain, Superintendent and D.M.O., Karimnagar, demonstrated a case where he has successfully removed a filarial scrotum weighing roughly 40 lbs. and also presented a case which was referred by the Medical Officer, to the Headquarters Hospital, Karimnagar, for suspecting it to be a case of 'Obstructed Hernia'. He was operated at the Headquarters Hospital and found out to be a case of Acute Haematocele of the Cord.

The Members were invited to dinner by Dr. Safdar Ali, private practitioner, Karimnagar and the meeting came to an end with the vote of thanks by the Hony. Secretary.

KATIHAR BRANCH—An ordinary meeting of the branch was held on 27-8-61. In absence of president, Dr. G. M. Mukherjee presided and 17 members were present.

The election of president and vice-president of the State Branch was done.

K.F.G. LOCAL BRANCH—The monthly clinical meeting was held on 25-8-61 at 7 P.M. at the Civil Hospital, Robertsonpet. Thirteen members were present. Dr. H. D. Chandrappa Gowda presented a case of Enlargement of Liver and Spleen in a boy aged about fourteen years and he also presented a case of Unilateral Swelling of the Leg in an old woman aged 60 years. Discussion followed.

KRISHNA BRANCH—On 1-4-61, a symposium on Acute Abdomen was held. The speakers were: Dr. M. B. C. Reddy (Aetiology), Dr. D. Subba Rao (Diagnosis), Dr. T. Narayana Reddy (Management). Dr. P. S. Chalapatha Rao was in the chair.

On 30-4-61, at a meeting with Dr. T. Narayana Reddy in the chair, the Central circular regarding proposals to bring doctors' dispensaries under the provision of the Drug Rules was considered. It was unanimously agreed that it was derogatory to the profession.

Dr. Y. R. Reddy of Guntur spoke on two common ailments of children, Effects of Heat and Infantile Diarrhoea.

Dr. J. V. R. Sarma, Secretary, Andhra State Branch spoke about the I.M.A. and its functions.

The meeting on 30-6-61 was presided over by Dr. T. Narayana Reddy. A resolution for making arrangements for medical inspection of students was passed, as also another on enhancing the monthly subscription by 50 nP. to build up a library.

Dr. T. T. V. Subrahamanyeswara Rao spoke on the Aetiology of Jaundice and Dr. D. Subba Rao on the Management of Jaundice.

Glaxo Laboratories exhibited two films—Griseofulvin and Poliomyelitis. Dr. D. Bharkara Rao, District Publicity Officer, exhibited a film on Family Planning.

Dr. C. Subba Rao was the host at a tea at the beginning of the meeting.

Dr. T. Narayana Reddy presided over a meeting on 9-7-61. A resolution condoling the death of Lt.-Col. T. S. Sastry was adopted.

A special meeting was held on 15-7-61 to bid farewell to Dr. T. Narayana Reddy who was going on transfer. Dr. Subba Rao played host.

The meeting held on 26-7-61 was presided over by Dr. M. Seshcharyulu, Dr. H. M. Rao was unanimously elected President of the Branch. Elections of President and Vice-Presidents of Central I.M.A. were held.

Dr. A. Chakravarty of Gudivada spoke on Fractures and Dislocations with demonstration of a good number of x-rays. Tea was served with Dr. V. Subramiah playing the host.

MADHIPURA BRANCH—It was decided to hold the 21st Annual Medical Conference at Saharsa in November, 1961. Meeting of the members of the Reception Committee were held at Supaul on 21-7-61 and at Madhipura on 6-8-61.

One meeting of Subdivisional Finance Committee was held on 18-8-61 at Madhipura at the residence of Dr. H. N. Das in which it was decided to collect fund in order to make the Conference a success.

A special general meeting of the branch was held on 2-8-61 at 8 P.M. at the residence of Dr. H. N. Das, Secretary, Madhipura branch. Six members were present. Dr. R. N. Singh, President being absent Dr. B. D. Ganguly took the chair. Election of President and 3 vice-presidents for the Central Office was taken up and was duly completed. Result was communicated to the Central Office, Delhi. Regarding the holding of the Bihar State Medical Conference at Saharsa in November 1961. All the members of this branch assured full support to the Conference.

MADRAS CITY BRANCH—The Executive Committee Meeting of the branch was held at Hotel Ashok at 7-30 P.M. on 3-8-61.

Before the commencement of the meeting, the members condoled the death of Lt. Col. Shastri and Dr. U. Krishna Rao and passed suitable resolutions.

As a mark of respect, two minutes of silence was observed.

The minutes of the last meeting of the Executive Committee was passed with slight corrections. The applications of the four new members, viz. Dr. W. J. C. Rebello, Dr. M. A. Rasheed, Dr. S. Arunugam, and Dr. R. K. Thirapad, was placed and they were admitted

as members of the Association. Regarding the I.M.A. Building, the steps taken so far to acquire a site behind the University Buildings were placed before the Committee. This particular site under reference was required for the Board of Revenue and hence the Secretary to Government suggested to our President, alternative sites in the Tank Bund Road. The matter will be pursued further. The sub-committee's report in respect of CFC, members list and arrears of work was considered and adopted.

The correspondence with the Centre and State was explained by the Hony. Secretary to the members present.

The following resolution was also passed.

"This meeting of the Executive Committee of the Indian Medical Association, Madras City Branch learns with deep regret the proposed shifting of the Chemotherapeutic Centre attached to the Government T.B. Clinic at Chetput to Bangalore".

MADURA BRANCH—The general body meeting of the branch was held on the 25th June 1961, under the presidentship of Dr. Abdul Sathar, Madurai. The secretary read the previous monthly meeting minutes which was passed unanimously. The Secretary called for nominations for one president and two vice-presidents of the Madras State Branch, I.M.A., for the year 1961-62.

Dr. P. K. Krishnakutty, Hony. Physician, Government General Hospital, Madras, gave an interesting lecture on Certain Aspects of Coronary Heart Disease and Dr. V. Sankaran, Professor of Surgery, Tanjore Medical College in Madurai, and Surgeon, Erskine Hospital, Madurai, gave an interesting lecture on Acute Abdominal Surgical Conditions. The secretary proposing a vote of thanks the meeting terminated.

A monthly meeting of the branch was held on the 22nd July 1961 under the presidentship of Dr. Abdul Sathar, Madurai. The Secretary read the previous monthly meeting minutes which was passed unanimously. Election of one president and three vice-presidents for the Central Office, Indian Medical Association, Delhi, was conducted. Dr. Jayakumar, Medical Officer, Infectious Disease Hospital, Madurai, gave an interesting lecture on Newer Trends in Medicine. The Secretary proposing a vote of thanks the meeting terminated.

MANDVI BRANCH—A film show was arranged on 23-8-61 under the auspices of Mandvi branch. All the medical practitioners of the city and from the surrounding villages attended the film show. Dr. V. P. Dandekar, the president of the branch presided over the function and welcomed the guests. The following films were shown (i) Siquil, (ii) Kenacort, (iii) Moniliasis.

MEERUT BRANCH—A meeting was held on 7-5-61. Dr. R. Mital presided, 28 members being present. After some routine business, nominations of President and Vice-Presidents for I.M.A. were made.

Dr. M. L. Suri of Military Hospital, Meerut Cantonment, addressed the meeting on the Management of Acute Myocardial Infarction. A lively discussion followed in which several members took part.

Two new members were introduced to the House. The meeting came to a close with a vote of thanks for the chair.

At a meeting held on 22-7-61 resolutions were adopted to mourn the sudden accidental deaths of Dr. D. S. Sarin on 5-6-61 and Dr. Ratan Lal Agarwal on 11-6-61.

In another meeting (date not mentioned) a protest resolution on the U.P. Government's action in including the B.M.B.S. degree in the Register of the U.P. Medical Council. The stand taken by the U.P. State Branch of the I.M.A. was fully endorsed.

In a meeting of the branch held on 13-8-61 the members of the branch congratulated Dr. Raja Ram Mital, the president of the branch on his being elected as Secretary, Meerut College, Meerut.

MONGHYR BRANCH—A meeting of the branch was held on 6-8-61 under the presidentship of Dr. Jagannath Prasad. Besides routine business, election was held for president and vice-presidents of central office, I.M.A. for the year 1961-62. It was decided to hold the annual meeting in the month of September 1961 and Dr. N. Hassan invited for the same.

A meeting of the branch was held on 28-8-61 under the presidentship of Dr. K. P. Mitra. The house extended invitation to the Behar State Branch for holding the September State Council meeting at Monghyr on 24th September 1961. Election was held for president and vice-presidents of Behar State Branch for the year 1961-62. A tentative programme for the State Council meeting was drawn subject to approval of the State Branch.

MORVI BRANCH—A meeting was held on 3-8-61. Dr. D. G. Dave read an article on Closed Cardiac Massage. Election of President and Vice-Presidents of I.M.A. was done.

NAGAPATNAM BRANCH—A clinical meeting of the branch was held at the Government Hospital, Nagapattinam, presided by Dr. A. Thiagarajan on 4-6-61 at 5 P.M. Dr. Easwaran, Senior Medical Officer, took all the members to the Wards and showed very many interesting cases.

A clinical meeting of the branch was held on 2-7-61 at 6 P.M. in the Government Hospital premises, Nagapattinam. Dr. A. Thiagarajan presided and Dr. Easwaran, Senior Medical Officer, Government Hospital, Nagapattinam spoke on the subject "Vomiting", and demonstrated cases.

NAGPUR BRANCH—A meeting was held on 16-7-61. Ten members were present. It was resolved to make an all-out effort to increase membership. Discussions were held on the Treatment of Guinea Worm Infection. Dr. A. H. Qureshi narrated some of his experiences. Dr. O. C. Mathur demonstrated one operated case of Strangulated Umbilical Hernia with Pregnancy. Dr. J. P. Purohit demonstrated a case of Malignant Liver.

Elections of President and Vice-Presidents of the State Branch and Centre were held.

NAVASARI BRANCH—A meeting of the branch was held on 27-7-61, Dr. Prahladbhai M. Luhar, an eminent consulting physician and lecturer of Baroda Medical College, Baroda was the Chief Guest.

Dr. R. G. Desai welcomed the chief guest. Thereafter Dr. Babulal H. Shah, Secretary of the branch introduced the guest to members of the branch.

Dr. Luhar gave a talk on 'Viral Hepatitis'. He discussed in details the aetiology, pathology, clinical signs and symptoms, prognosis and laboratory investigations and treatment with reference to latest broad spectrum antibiotics and corticoateroids.

NELLORE BRANCH—A meeting was held on 22-7-61, Dr. K. M. Matthew presiding. Elections of President and three Vice-Presidents, Centre, were conducted.

Dr. P. K. Krishnan Kutty of Madras gave an instructive talk on Cardiac Emergencies in General Practice.

PILIBHIT BRANCH—A meeting of the branch was held on 22-7-1961. The members condoled the death of Dr. R. L. Agarwal and conveyed their sympathy to the bereaved family. A protest resolution against the Government decision of including and registering the B.M.B.S. degree holders in the U. P. State Medical Council Register under the Act of 1917 along with M.B.B.S. personnel was unanimously passed.

PORBANDAR BRANCH—A meeting of the Branch was held on 16-4-61. Sixteen members were present. Dr. H. H. Chavda was in the chair. Dr. G. M. Thanki discussed a case of Tubercular Multiple Synovitis. The

case was discussed with full investigation and treatment. This case was brought from Bhavsinhji Hospital, Porbandar.

A meeting of the branch was held on 23-7-61. Ten members were present. Dr. H. H. Chavda was in the chair. Dr. G. M. Thanki reported 3 cases of Miliary Tuberculosis treated with cortisone in addition to the usual Anti T.B. Drugs. X-ray plates were shown before and after the treatment with cortisone and Anti T.B. Drugs. The meeting ended after dinner.

RAMANATHAPURAM BRANCH—The annual meeting of the branch was held at Virudhunagar on the 20th August, 1961 at 5 P.M. under the presidentship of Dr. S. Raju Ayyar. The following office-bearers were elected for the year 1961-62. President—Dr. S. Raju Ayyar, Vice-president—Dr. T. Muthusamy, Secretary and Hony. Treasurer—Dr. K. C. Natarajan, State Council Representatives—Dr. D. K. Jeyabalraj, Dr. H. Lysander, Central Council Representative—Dr. S. Raju Ayyar, Managing Committee—Dr. M. Sadasivam and Dr. H. Charles Devadoss.

Dr. K. A. Ramalingam of Madurai spoke on Common Orthopaedic Conditions. He stressed the important practical points in the treatment of C.T.E.V. and Polio and also told the important role of Surgery in the treatment of Skeletal Tuberculosis.

SHAJAPUR BRANCH—The annual meeting took place on 26-7-1961. The secretary read the annual report and the statement of accounts were presented by the treasurer. Office-bearers for the year 1961-62 were elected with Dr. A. K. Sharma as President, Dr. B. L. Jain as Secretary and Dr. G. A. Munfee as Treasurer.

Members decided to start a centre for the survey of Guineaworm cases in Shajapur Tehsil.

SHIMOGA BRANCH—A monthly clinical meeting of the branch was held under the chairmanship of Dr. S. V. Raja Rao on 25-6-1961 at McGann Hospital, Shimoga. The Mid Annual Gathering was also conducted on the same day. Dr. Venkataramana Setty addressed the members.

The monthly clinical meeting of the branch was held under the chairmanship of Dr. Wif, W.H.O. Consultant. Dr. H. Emerictx, W.H.O. Adviser to Government of India and Dr. Venkata Shamanna spoke on Problems of Leprosy.

Members of the branch and of the medical profession in Shimoga Town are rendering voluntary service in implementing the D.P.T. Immunisation programme. So far immunisation programme has covered two of the divisions of this town. Children in the age group 4 months to five years are given the benefit of protective inoculations.

The monthly clinical meeting was held on 26-8-61 at 6 P.M. at McGann Hospital, Shimoga, under the chairmanship of Dr. K. S. Shadaksharappa. (1) Dr. T. Manickam of Bangalore addressed on Congenital Anomalies of the New Born, (2) Dr. T. S. Jayaram of Bangalore, addressed on Mechanism of Bronchial Obstruction, (3) Dr. H. R. Basavaraj of Hubli, addressed on Olfactory Discrimination.

SRIKAKULAM BRANCH—A meeting presided over by Dr. N. P. Devdas and attended by 20 members, was held on 10-6-61. The following cases were demonstrated by Dr. N. P. Devdas and Dr. C. Pattabhirama: (1) A case of Renal Calculus, (2) A case of Cancer of the Liver, (3) A case of Urethral Calculus in a boy, (4) A case of Bronchogenic Carcinoma, (5) A case of Tumour Abdomen, and (6) Four Cardiac cases were put up for examination.

It was decided to hold the anniversary celebrations in July.

Another meeting was held on 8-7-61. Dr. P. N. Devdas presided. Fourteen members attended. Dr. K. Sanyasirao gave an exhaustive lecture on Mental Diseases.

TIRUCHY BRANCH—A meeting of the branch was held on the 17th June 1961 at the Association premises, Tiruchy. 40 members were present. Dr. P. V. Sundaram, the president presided. The following condolence resolution was moved from the chair and passed unanimously all members standing in silence for 2 minutes.

"This meeting of the Tiruchy Branch of I.M.A. records with great regret the sad demise of Dr. M. R. Bhat, Turaiyur, an oldest member of the Association and requests the Secretary to send a copy of this resolution to the members of his family."

After the minutes of the previous meeting which was unanimously approved the president requested Dr. G. Joseph Gnanadickam to occupy the chair for the Symposium on Ophthalmology.

Dr. T. V. Ranganathan, Hony. Asst. Medical Officer, Government Headquarters Hospital, Tiruchy, addressed the members on Recent Advances in Ophthalmology. Dr. T. Amirudeen Ahmad, Tiruchy addressed the members on Ocular Manifestations of Vitamin Deficiencies. Dr. G. Joseph Gnanadickam addressed the members on Problems of Headache and its treatment.

The nominations for the office of the president and vice-presidents were held.

ULUBERIA BRANCH—A clinical meeting was held at the Ludlow Dispensary on 29-7-1961 under the auspices of the branch. Dr. K. P. Mitra talked on the "Problem of Industrial Accident and its Prevention". The salient points of his talk were as follows: (1) Of the various classes of accidents, industrial accidents were not only important but the matter was also more thoroughly studied in the highly industrialised countries like U.S.A., U.K. and European Continent. It is now generally accepted that industrial accident causes enormous loss of industrial production and huge loss of money in addition to suffering, disability and death to the victims involved in the accidents. (2) The important studies made in U.S.A. and in the Western countries and to some extent in India were also reviewed. (3) In all the studies so far made, among the various factors, which were observed to lead to accidents, human factor was found to be the most important. Safe machines and correct method of work were of primary importance and the modern industrial technology has practically solved these aspects of the problem of accident. The complex human factor of the problem of accident is yet to be solved. (4) It was necessary to stimulate interest in prevention of accident, which could be given an effective practical shape. (5) Safety consciousness by forming Safety Committees and Councils at various levels with the employer, employee and with the Government participation, were the first important steps in accident prevention. Secondly, training of the new entrants in the job, correct method of work are practical measures in accident prevention which can be done without much difficulty. Thirdly, the veteran workers are to be constantly informed of the dangers inherent in a specific work situation. (6) Thorough investigation of each accident, collection of data and its interpretations are also important in prevention of accident. (7) Industrial medical officers and the E.S.I. panel doctors can also contribute greatly in minimising the suffering and disability by giving prompt and adequate treatment in the earlier stage and taking suitable measures to rehabilitate workers who have suffered accidental injuries. The industrial medical officer can also make positive contribution in Safety Councils and Committees in accident prevention particularly in tackling the complex problem of the human factor of accidents. (8) To sum up the accidents are preventible to a great extent and is worth taking all measures to prevent them.

VAVAR KUNDLA BRANCH—The following are the office-bearers of the branch for 1961-62. President—Dr. A. D. Mehta; Vice-president—Dr. B. Z. Mehta; Hony. Secretary—Dr. N. B. Joshi.

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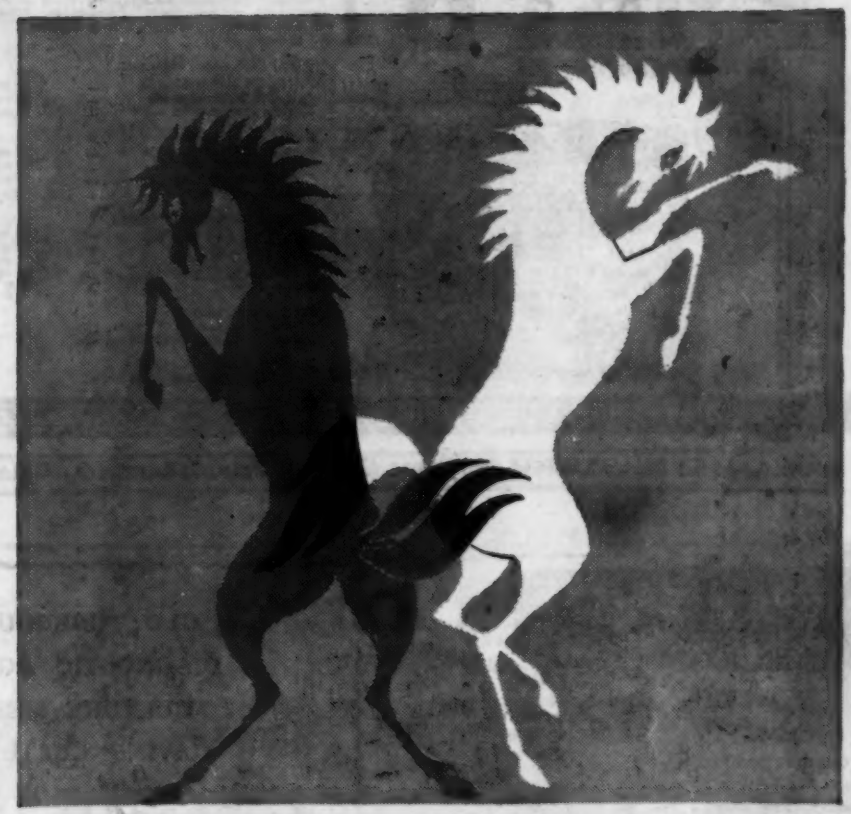

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